Measurement: Converting Units of Volume

Aim:	**Success Criteria:**	**Resources:**
Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places. I can read, write and convert between standard units of volume.	I can convert from litres to millilitres, by multiplying by 1000. I can convert from millilitres to litres, by dividing by 1000. I can solve problems involving mixed volume measurements.	**Lesson Pack** Individual whiteboards and pens – class set
	Key/New Words: Convert, volume, litre, millilitre, decimal place.	**Preparation:** **Divide By 1000 Matching Cards** – one set per pair Differentiated **Converting Units of Volume Activity Sheet** – one per child **Extra Challenge Activity Sheet** – as required

Prior Learning: It will be helpful if children know the basic conversions of metric measurements of volume.

Learning Sequence

Divide By 1000 Matching Cards: In pairs, children play the Divide By 1000 Matching Game. They shuffle the **Divide By 1000 Matching Cards**. They place them face down and take turns to find matching cards. The player with the most cards at the end of the game is the winner.

Converting Between Litres and Millilitres: Children convert between litres and millilitres. They convert from litres to millilitres by multiplying by 1000 and from millilitres to litres by dividing by 1000. The measurements and answers are in whole litre measurements and measurements with one, two and three decimal places. Children complete a variety of activities to practise their skills of conversion.

Volume Problems: In pairs, children solve two problems where they need to convert from one unit to another. In the first problem, children write a measurement which would fit between two measurements, one written in millilitres, the other written in litres. The second problem needs multiplication and division to calculate the answer.

Converting Units of Volume: Children complete the differentiated **Converting Units of Volume Activity Sheet**, converting from litres to millilitres and vice versa and comparing volume measurements.

Children convert from litres to millilitres and vice versa: whole litre measurements and measurements with one, two and three decimals places. They identify errors in a set of conversions. They write a measurement that would fit between two measurements, one written in litres, the other in millimetres. They answer a simple word problem, involving converting units of measurement.

Children convert from litres to millilitres and vice versa: measurements with one, two and three decimal places. They complete volume calculations and place them in the correct place on a sorting chart. They identify errors in a set of conversions. They solve a word problem, involving multiplication and comparing units of measurement.

Children convert from litres to millilitres and vice versa: measurements with one, two and three decimals places. They identify errors in a set of conversions. They identify a measurement from mixed measures which are closest to 5l. They solve a word problem, involving division, subtraction and passage of time. An **Extra Challenge Activity Sheet** is also included.

Spot the Errors: Children identify errors in conversions shown on the **Lesson Presentation**. They compare mathematical statements using <, > and =.

Exploreit

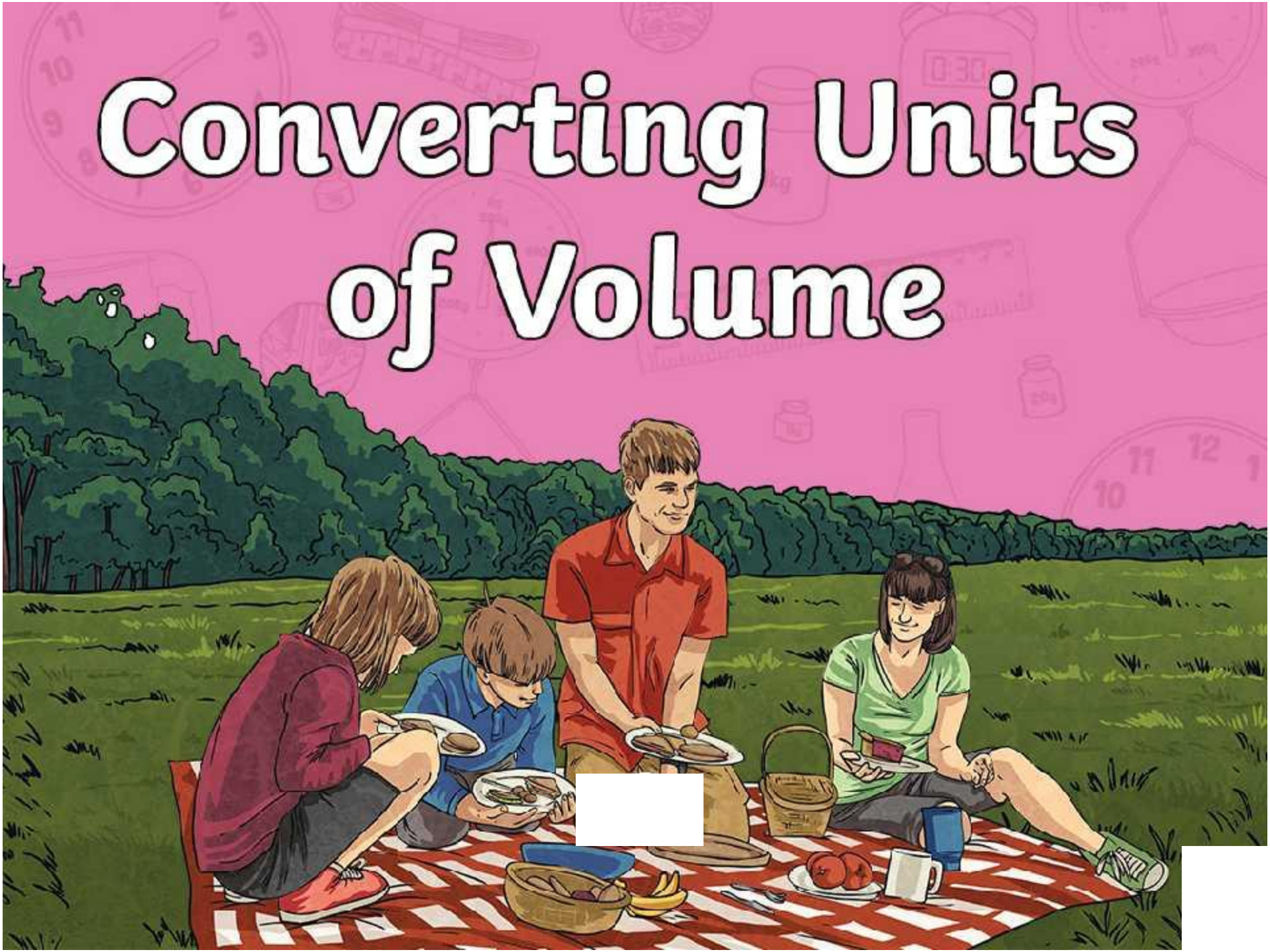
Writeit: Children write three problems which involve conversion of volume units. The first problem needs to have the answer 1.5l; the second problem needs to have the answer 200ml; the third problem to have the answer 2.75l.

Measureit: Children measure the capacity of different sized containers (from plastic storage boxes to egg cups). They record the measurements in litres (using decimal notation) and millilitres.

Maths

Measurement

Converting Units of Volume



Aim

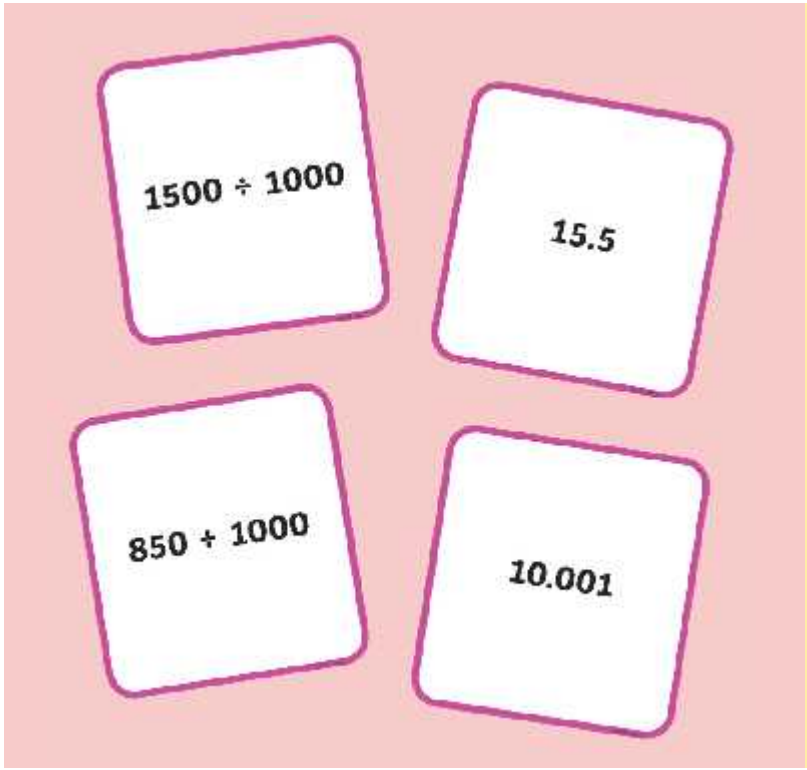
I can read, write and convert between standard units of volume.

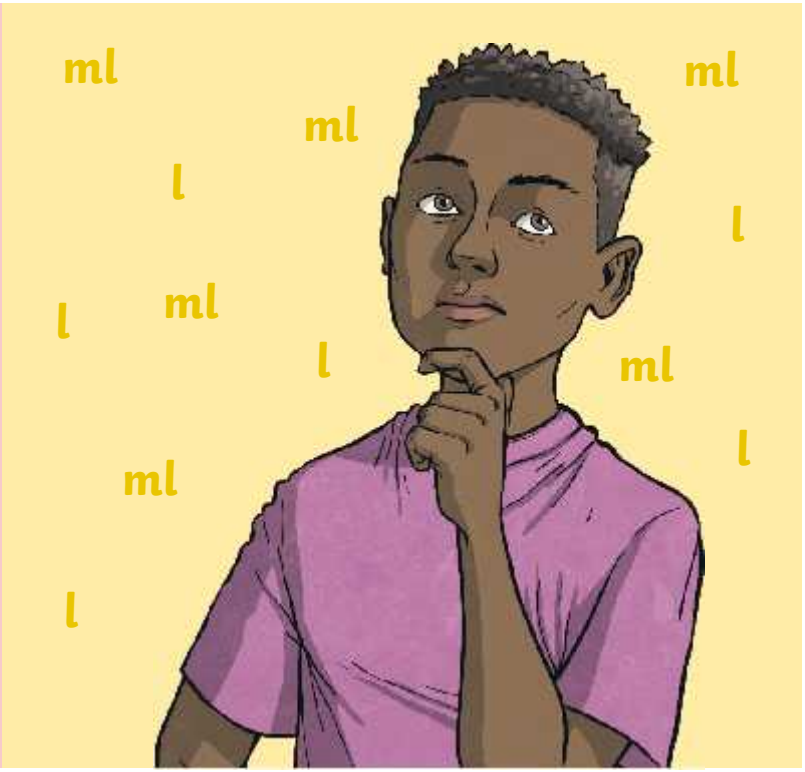
Success Criteria

- I can convert from litres to millilitres, by multiplying by 1000.
- I can convert from millilitres to litres, by dividing by 1000.
- I can solve problems involving mixed volume measurements.

Divide By 1000 Matching Cards

With your partner, play the **Divide By 1000 Matching Game**. Shuffle the cards. Place them face down and take turns to find matching cards. The player with the most cards at the end of the game is the winner.



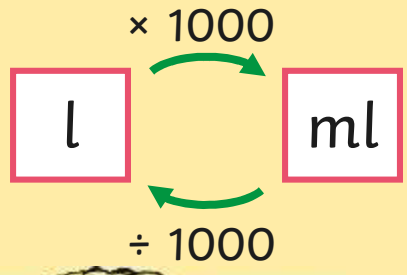


Converting Between Litres and Millilitres

How do you convert from litres to millilitres?
Multiply by 1000.

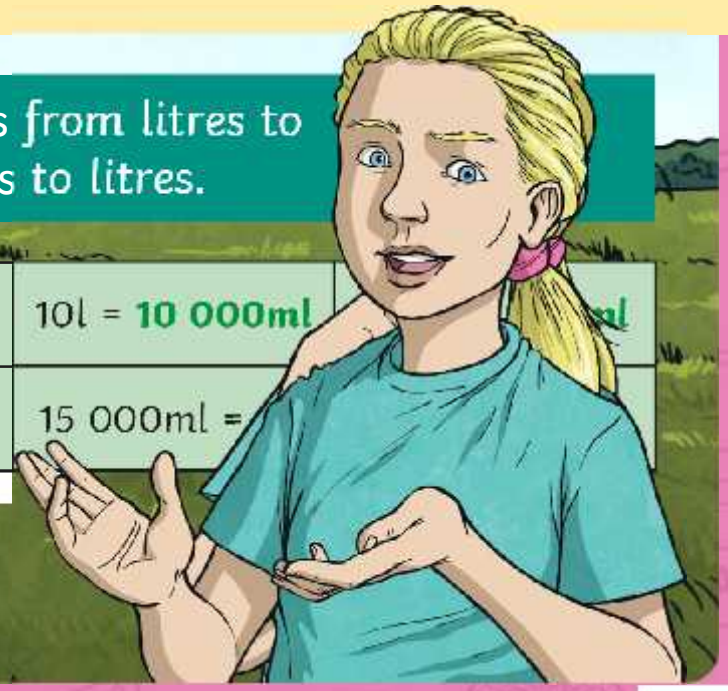
How do you convert from millilitres to litres?
Divide by 1000.

How many millilitres are there in a litre?
There are 1000 millilitres in a litre.



Convert these measurements from litres to millilitres and millilitres to litres.

8l = **8000ml**	6l = **6000ml**	7l = **7000ml**	10l = **10 000ml**
4000ml = **4l**	6000ml = **6l**	9000ml = **9l**	15 000ml =

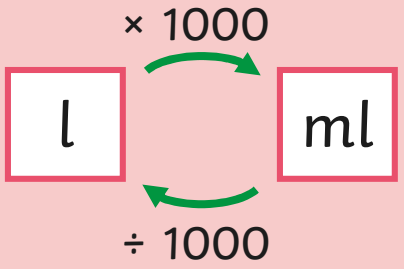


Converting Between Litres and Millilitres

Converting Measurements with Three Decimal Places.

1.457l = ?ml
1.457 × 1000 = 1457
1.457l = 1457ml

3218ml = ?l
3218 ÷ 1000 = 3.218
3218ml = 3.218l



Convert to millilitres:		
9.455l	3.657l	2.963l
9455ml	**3657ml**	**2963ml**

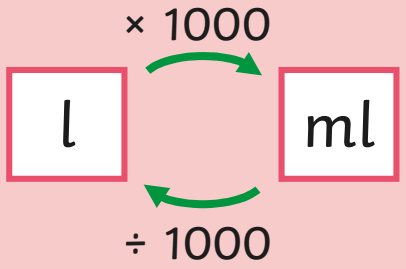
Convert to litres:		
9921ml	6875ml	8756ml
9.921l	**6.875l**	**8.756l**

Converting Between Litres and Millilitres

Converting Measurements with Two Decimal Places.

2.56l = ?ml
2.56 × 1000 = 2560
2.56l = 2560ml

8320ml = ?l
8320 ÷ 1000 = 8.32
8320ml = 8.32l



Match the correct conversions.

4.88l	4080ml	8440ml	4.84l	0.48l	8040ml

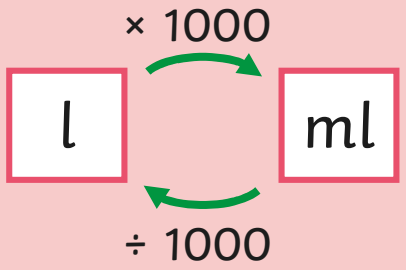
480ml	8.04l	4840ml	4880ml	8.44l	4.08l

Converting Between Litres and Millilitres

Converting Measurements with One Decimal Place.

5.2l = ?ml
5.2 × 1000 = 5200
5.2l = 5200ml

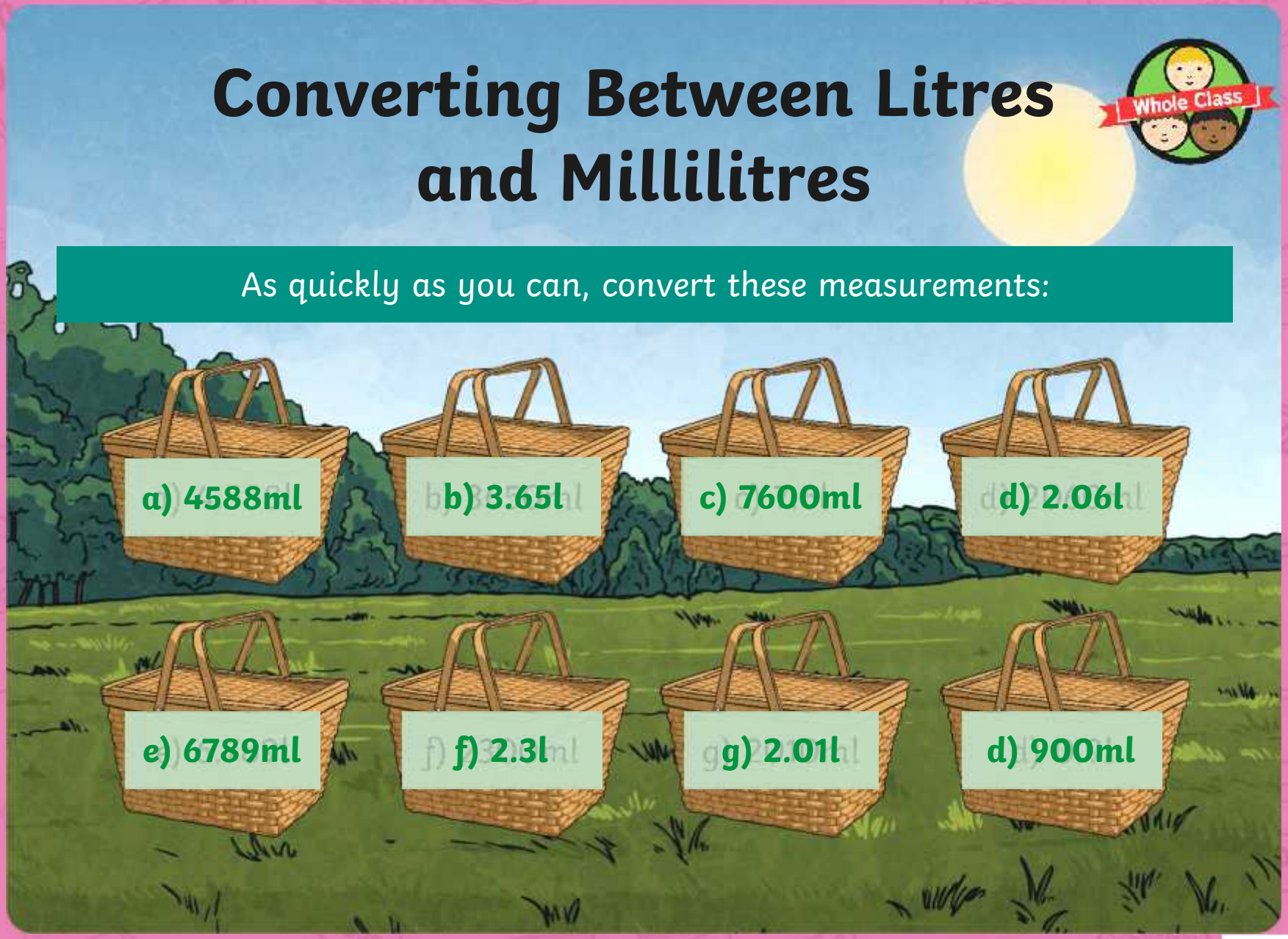
6700ml = ?l
6700 ÷ 1000 = 6.7
6700ml = 6.7l



Lara has done her homework, converting between measurements with one decimal place. These are her answers. Mark her work and correct any mistakes.

7.9l = ?ml	7900ml ✓
6900ml = ?l	6.9l ✓
3400ml = ?l	34l × **3.4l**
8.9l = ?ml	8900ml ✓
0.7l = ?ml	7000ml × **700ml**
4400ml = ?l	4.4l ✓

Converting Between Litres and Millilitres



As quickly as you can, convert these measurements:

a) 4588ml

b) 3.65l

c) 7600ml

d) 2.06l

e) 6789ml

f) 2.3l

g) 2.01l

d) 900ml

Volume Problems

3 children have a container, each containing a different amount of water.

My container has 3.5l in it.

Freddy

My container has 5355ml in it.

Jusna

My container has a greater volume than Freddy's but smaller than Jusna's.

Athena

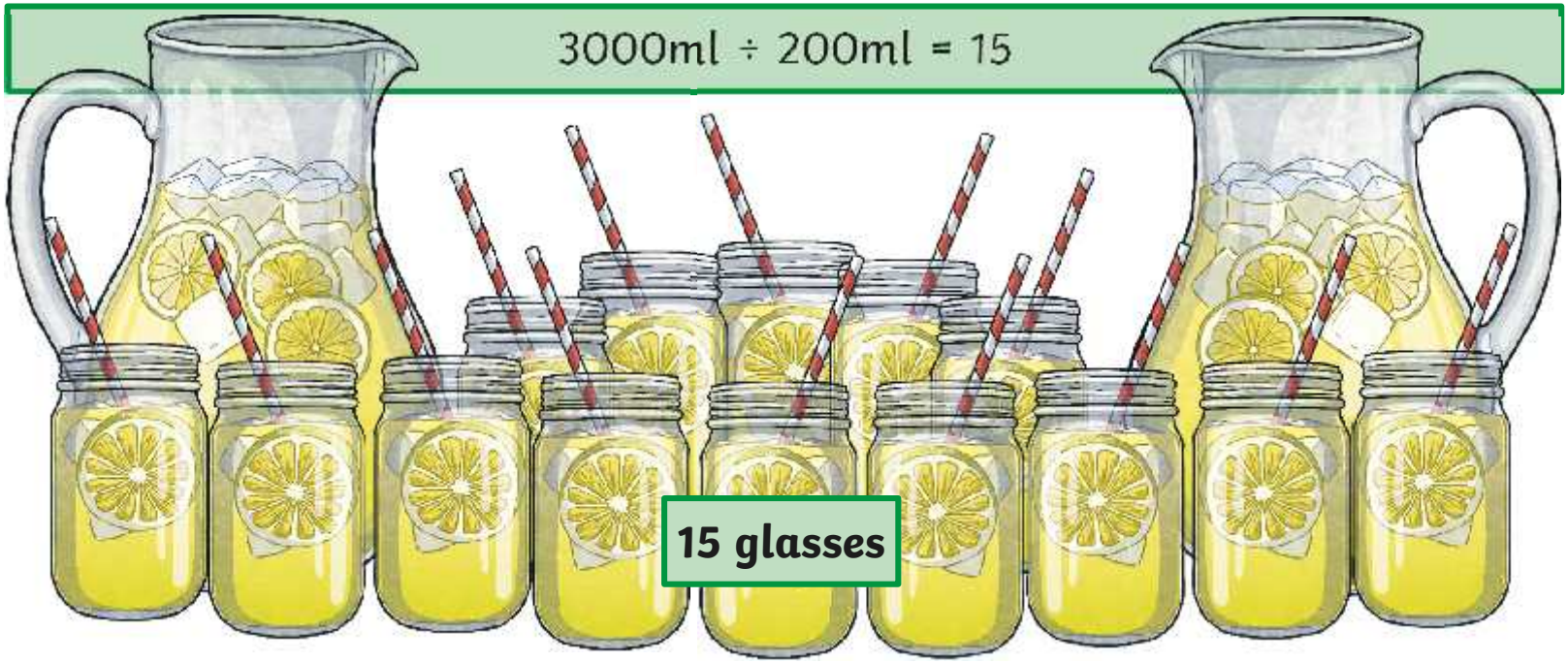
Write two different possible measurements for the volume of Athena's container. Write one measurement using millimetres and the other in litres, using decimals.

Athena's container could contain any volume of liquid between 3501ml and 5354ml. For example, 3.6l or 5000ml.

Volume Problems

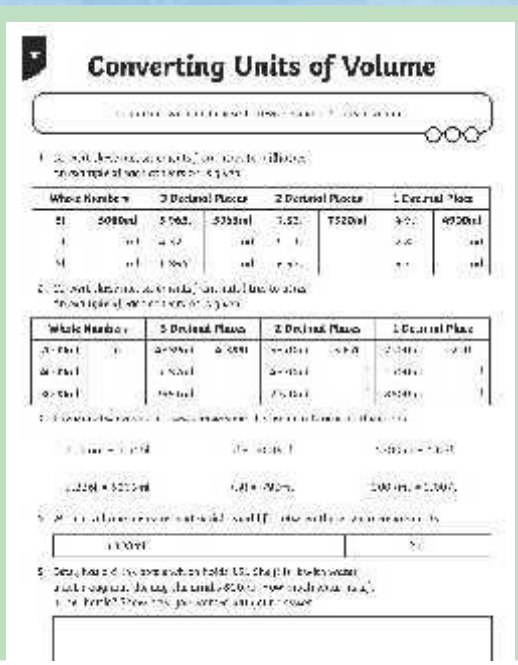
Glasses of lemonade have 200ml in them. A jug of lemonade has 1.5l. If I had 2 jugs of lemonade, how many glasses of lemonade would have the same amount?

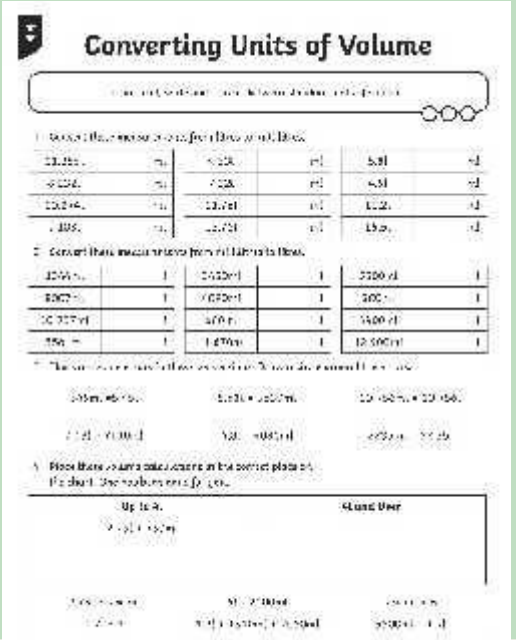
What conversion will you do to work out the answer?

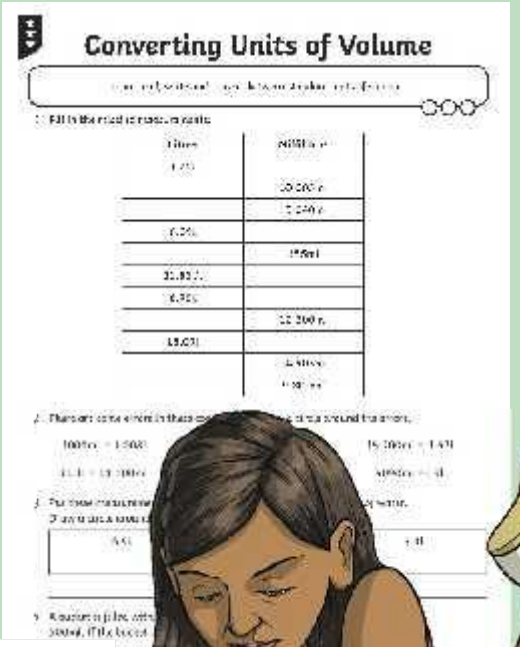


Converting Units of Volume

Use your marvellous conversion skills to complete these activity sheets.







Spot the Errors

There are some errors on this slide. Can you spot them?

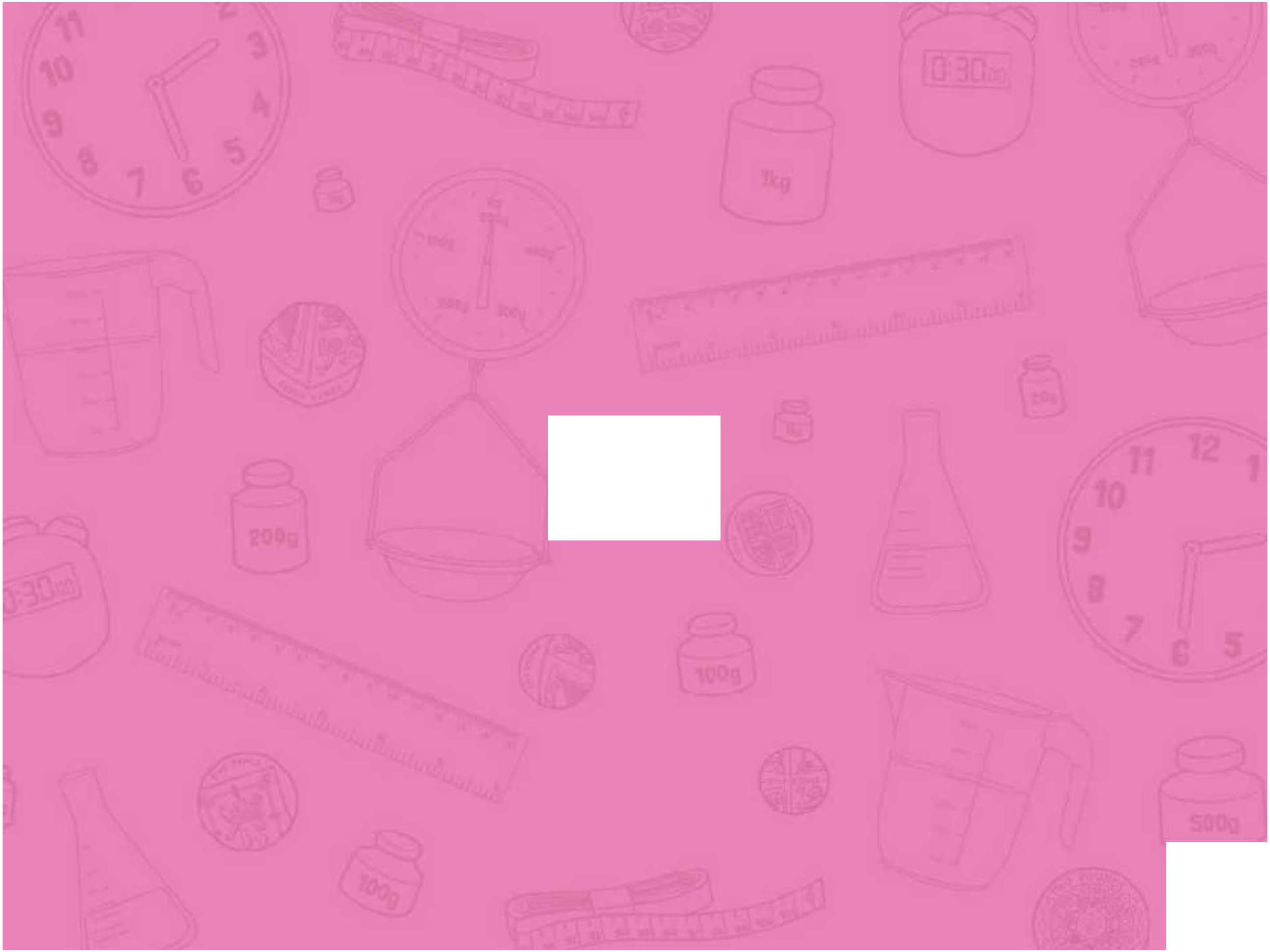
7.5l + 450ml	<	9l	**5l – 4.75l**	=	**35ml**
6000ml + 0.6l	>	6.55l	3.9l	=	2500ml + 1.4l
9350ml + 275ml	**<**	**9.6l**	450ml × 11	<	5l

Aim

I can read, write and convert between standard units of volume.

Success Criteria

- I can convert from litres to millilitres, by multiplying by 1000.
- I can convert from millilitres to litres, by dividing by 1000.
- I can solve problems involving mixed volume measurements.



Aim: I can read, write and convert between standard units of volume.				**Date:**					
				Delivered By:			**Support:**		
Success Criteria	**Me**	**Friend**	**Teacher**	**T**	**PPA**	**S**	**I**	**AL**	**GP**
I can convert from litres to millilitres, by multiplying by 1000.				**Notes/Evidence**					
I can convert from millilitres to litres, by dividing by 1000.									
I can solve problems involving mixed volume measurements.									
Next Steps) _____) _____									

T	Teacher	**I**	Independent
PPA	Planning, Preparation and Assessment	**AL**	Adult Led
S	Supply	**GP**	Guided Practice

Aim: I can read, write and convert between standard units of volume.				**Date:**					
				Delivered By:			**Support:**		
Success Criteria	**Me**	**Friend**	**Teacher**	**T**	**PPA**	**S**	**I**	**AL**	**GP**
I can convert from litres to millilitres, by multiplying by 1000.				**Notes/Evidence**					
I can convert from millilitres to litres, by dividing by 1000.									
I can solve problems involving mixed volume measurements.									
Next Steps) _____) _____									

T	Teacher	**I**	Independent
PPA	Planning, Preparation and Assessment	**AL**	Adult Led
S	Supply	**GP**	Guided Practice

Converting Units of Volume

I can read, write and convert between standard units of volume.

1. Convert these measurements from litres to millilitres.
   An example of each conversion is given.

Whole Numbers		3 Decimal Places		2 Decimal Places		1 Decimal Place	
5l	**5000ml**	5.965l	**5965ml**	7.32l	**7320ml**	4.9l	**4900ml**
2l	ml	4.321l	ml	9.11l	ml	2.8l	ml
8l	ml	1.854l	ml	6.52l	ml	5.5l	ml

2. Convert these measurements from millilitres to litres.
   An example of each conversion is given.

Whole Numbers		3 Decimal Places		2 Decimal Places		1 Decimal Place	
7000ml	**7l**	4389ml	**4.389l**	5870ml	**5.87l**	2900ml	**2.9l**
4000ml	l	1087ml	l	4330ml	l	1700ml	l
3000ml	l	2351ml	l	7720ml	l	8600ml	l

3. There are two errors in these conversions. Draw a circle around the errors.

7545ml = 7.545l	5l = 5000ml	6300ml = 6.03l
5.236l = 5236ml	7.9l = 790ml	3007ml = 3.007l

4. Write a volume measurement which would fit between these two measurements:

1800ml		2.5l

5. Betsy has a drink bottle which holds 1.5l. She fills it with water and throughout the day she drinks 800ml. How much water is left in her bottle? Show how you worked out your answer.

Converting Units of Volume

I can read, write and convert between standard units of volume.

1. Convert these measurements from litres to millilitres.

11.255l	ml	4.33l	ml	5.8l	ml
8.232l	ml	7.32l	ml	4.5l	ml
10.274l	ml	11.76l	ml	11.2l	ml
7.103l	ml	13.78l	ml	15.5l	ml

2. Convert these measurements from millilitres to litres.

1344ml	l	3450ml	l	5500ml	l
8007ml	l	4090ml	l	200ml	l
10 987ml	l	660ml	l	6400ml	l
5561ml	l	11 870ml	l	12 900ml	l

3. There are some errors in these conversions. Draw a circle around the errors.

545ml = 5.45l	5.63l = 5630ml	10 756ml = 10.756l
7.13l = 7130ml	4.8l = 4080ml	2235ml = 22.35l

4. Place these volume calculations in the correct place on the chart. One has been done for you.

Up to 4l	**4l and Over**
2.75l + 750ml	

2.75l + 750ml	6l – 2100ml	750ml × 6
1.7l × 3	1.9l + 1500ml + 2050ml	5500ml – 1.9l

5. At a picnic, Craig pours four glasses of 350ml of juice, Joe fills two jugs up to the 0.75l line. Joe says he has poured 150ml more than Craig has. Is he right? Explain how you know.

Converting Units of Volume

I can read, write and convert between standard units of volume.

1. Fill in the missing measurements:

Litres	Millilitres
1.25l	
	10 005ml
	15 040ml
6.09l	
	655ml
13.837l	
6.95l	
	12 200ml
15.09l	
	14 905ml
	9 800ml

2. There are some errors in these conversions. Draw a circle around the errors.

1008ml = 1.008l 6.123l = 6123ml 15 700ml = 1.57l

11.1l = 11 100ml 9.8l = 9080ml 4090ml = 4.9l

3. Put these measurements in order from smallest to largest volume of water.
Draw a circle around the measurement which is the closest to 5l.

4.9l	4009ml	5.1l
5010ml	4875ml	

4. A bucket is filled with 6l of water. It has a hole in it and every hour it loses 600ml. If the bucket is filled at 10 a.m., when will it be half full?

Converting Units of Volume **Answers**

1. Convert these measurements from litres to millilitres.
   An example of each conversion is given.

Whole Numbers		3 Decimal Places		2 Decimal Places		1 Decimal Place	
5l	5000ml	5.965l	5965ml	7.32l	7320ml	4.9l	4900ml
2l	**2000ml**	4.321l	**4321ml**	9.11l	**9110ml**	2.8l	**2800ml**
8l	**8000ml**	1.854l	**1854ml**	6.52l	**6520ml**	5.5l	**5500ml**

2. Convert these measurements from millilitres to litres.
   An example of each conversion is given.

Whole Numbers		3 Decimal Places		2 Decimal Places		1 Decimal Place	
7000ml	7l	4389ml	4.389l	5870ml	5.87l	2900ml	2.9l
4000ml	**4l**	1087ml	**1.087l**	4330ml	**4.33l**	1700ml	**1.7l**
3000ml	**3l**	2351ml	**2.351l**	7720ml	**7.72l**	8600ml	**8.6l**

3. There are two errors in these conversions. Draw a circle around the errors.

7545ml = 7.545l 5l = 5000ml 6300ml = 6.03l

5.236l = 5236ml 7.9l = 790ml 3007ml = 3.007l

4. Write a volume measurement which would fit between these two measurements:
   Multiple possible answers: a measurement greater than 1800ml and less than 2.5l. Answers can be written in litres or millilitres.

5. Betsy has a drink bottle which holds 1.5l. She fills it with water and throughout the day she drinks 800ml. How much water is left in her bottle? Show how you worked out your answer.
   700ml or 0.7l

Converting Units of Volume **Answers**

1. Convert these measurements from litres to millilitres.

11.255l	11 255ml	4.33l	4330ml	5.8l	5800ml
8.232l	8232ml	7.32l	7320ml	4.5l	4500ml
10.274l	10 274ml	11.76l	11 760ml	11.2l	11 200ml
7.103l	7103ml	13.78l	13 780ml	15.5l	15 500ml

2. Convert these measurements from millilitres to litres.

1344ml	1.344l	3450ml	3.45l	5500ml	5.5l
8007ml	8.007l	4090ml	4.09l	200ml	0.2l
10 987ml	10.987l	660ml	0.66l	6400ml	6.4l
5561ml	5.561l	11 870ml	11.87l	12 900ml	12.9l

3. There are some errors in these conversions. Draw a circle around the errors.

545ml = 5.45l (5.45l)

5.63l = 5630ml

10 756ml = 10.756l

7.13l = 7130ml

4.8l = 4080ml (4080ml)

2235ml = 22.35l (22.35l)

4. Place these volume calculations in the correct place on the chart. One has been done for you.

Up to 4l	4l and Over
2.75l + 750ml	1.9l + 1500ml + 2050ml
6l – 2100ml	750ml × 6
5500ml – 1.9l	1.7l × 3

2.75l + 750ml	6l – 2100ml	750ml × 6
1.7l × 3	1.9l + 1500ml + 2050ml	5500ml – 1.9l

5. At a picnic, Craig pours four glasses of 350ml of juice, Joe fills two jugs up to the 0.75l line. Joe says he has poured 150ml more than Craig has. Is he right? Explain how you know.

Joe is not right. Craig has poured 350ml × 4 = 1400ml
Joe poured 750ml × 2 = 1500ml
The difference between the 2 measurements is 100ml not 150ml.

Converting Units of Volume **Answers**

1. Fill in the missing measurements:

Litres	Millilitres
1.25l	1250ml
10.005l	10 005ml
15.04l	15 040ml
6.09l	6090ml
0.655l	655ml
13.837l	13 837ml
6.95l	6950ml
12.2l	12 200ml
15.09l	15 090ml
14.905l	14 905ml
9.8l	9 800ml

2. There are some errors in these conversions. Draw a circle around the errors.

1008ml = 1.008l

6.123l = 6123ml

15 700ml = 1.57l

11.1l = 11 100ml

9.8l = 9080ml

4090ml = 4.9l

3. Put these measurements in order from smallest to largest volume of water. Draw a circle around the measurement which is the closest to 5l.

4.9l	4009ml	5.1l
5010ml	4875ml	

4875ml, 4.9l, 4009ml, 5010ml, 5.1l

4. A bucket is filled with 6l of water. It has a hole in it and every hour it loses 600ml. If the bucket is filled at 10 a.m., when will it be half full?
3 p.m.

1500 ÷ 1000	15.5	850 ÷ 1000
10.001	0.1234	3200 ÷ 1000

15 500 ÷ 1000	3.2	10 001 ÷ 1000
123.4 ÷ 1000	0.85	1.5

1234 ÷ 1000

1.001

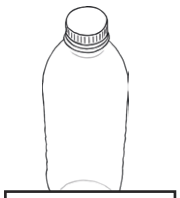
1.234

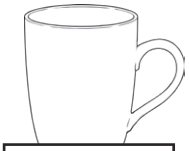
1001 ÷ 1000

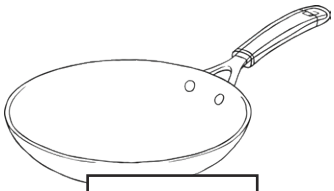
Grouping Measurements

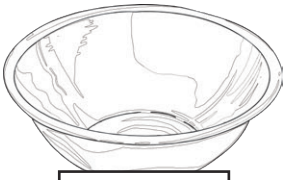
I can read, write and convert between standard units of volume.

The children have got these containers full of water.

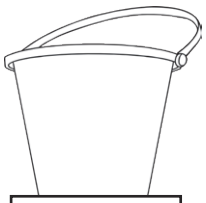

1.25l


650ml


3.45l

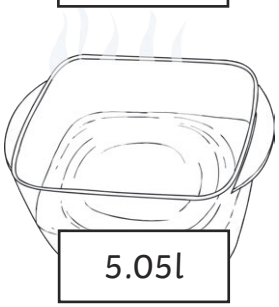

2755ml

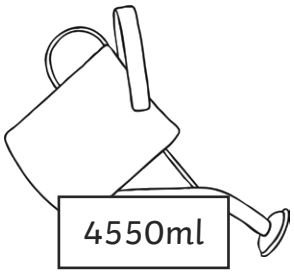

3.455l


4050ml


2.9l


4.5l


5.05l


4550ml


3.25l


890ml

How could they use the containers to fill these four buckets? Each bucket must have less than 1 litre of empty space.

 11 litres	 9 litres
 5 litres	 13 litres

Grouping Measurements **Answers**

There are several possible answers, here is one possible solution.

11 litres 4550ml 2.9l 3.45l = 10.9l	9 litres 3.455l 4.5l 650ml = 8605ml
5 litres 2755ml 890ml 1.25l = 4895ml	13 litres 4050ml 5.05l 3.25l = 12.35l

Measurement | Converting Units of Volume

I can read, write and convert between standard units of volume.		
I can convert from litres to millilitres, by multiplying by 1000.		
I can convert from millilitres to litres, by dividing by 1000.		
I can solve problems involving mixed volume measurements.		

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