## Measurement: Converting Millilitres and Litres

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Aim:
Convert between different units of metric
measure [for example, kilometre and metre;
centimetre and metre; centimetre and
millimetre; gram and kilogram; litre and
millilitre].
I can convert metric measures involving
volume and capacity (litres and millilitres).
```


## Success Criteria:

I can multiply by 1000 to convert measurements from litres to millilitres.

I can divide by 1000 to convert measurements from millilitres to litres.

I can convert between litres and millilitres to solve problems.

## Key/New Words:

Measurement, capacity, volume, convert, litres, millimetres, place value.

## Resources:

Lesson Pack
Individual whiteboards and pens - class set

## Preparation:

Volume Cards - class set, pre-cut Differentiated Measuring Smoothies Activity Sheet - one per child Decimal Place Value Chart - optional

Prior Learning: It will be helpful if children have used litres and millilitres to measure volume and know that there are 1000 millilitres in 1 litre.

## Learning Sequence

Make One Litre: Cut up the Volume Cards and give one to each child. (As the measurements on the cards vary in
difficulty, you may wish to distribute them based on ability.) Children should walk around the room and form groups in
which the measurements in millilitres on their cards add up to exactly one litre. There should be at least three people
in a group.
Diving into Mastery: Schools using a mastery approach may prefer to use the following as an alternative activity.
These sheets might not necessarily be used in a linear way. Some children might begin at the 'Deeper' section and in
fact, others may 'dive straight in' to the 'Deepest' section if they have already mastered the skill and are applying this
to show their depth of understanding.
Children convert between litres, millilitres and vice versa.

## Exploreit

Estimateit: In pairs, children take turns to pour water into a set of containers of different shapes. They write down their estimates for the amount of water in each container. Then, they measure the amount of water in each container. They compare the actual measurements to their estimates. Whose estimates came the closest?
Writeit: Children write their own volume and capacity problems on the Volume Problem Sheet, recording their question and answer. They swap their sheet with their partner and answer their partner's question.


## Maths

## Measurement



## Converting Millilitres and Litres



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## Converting from Litres to Millilitres

How many millilitres ( ml ) are in one litre (l)?
Class 5 are making frut smod anes for their class party.



## Converting from Litres to Millilitres


If the numbersech ovidude dineyzarexse, prakintigestioothöetheir position.



## Converting from Millilitres to Litres

 If the numbers imehoderemgntergisypainattidhtitnesto their position.








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| Aim: I can convert metric measures involving volume and capacity (litres and millilitres). |  |  |  | Date: |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Delivered By: |  |  | Support: |  |  |
| Success Criteria | Me | Friend | Teacher | T | PPA | S | I | AL | GP |
| I can multiply by 1000 to convert measurements from litres to millilitres. |  |  |  | Notes/Evidence |  |  |  |  |  |
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| I can convert between litres and millilitres to solve problems. |  |  |  |  |  |  |  |  |  |

## Next Steps

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


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## Decimal Place Value Chart

| $\begin{aligned} & \stackrel{n}{0} \\ & \stackrel{y}{\underline{1}} \end{aligned}$ |  |  | $\begin{aligned} & \text { n } \\ & \text { 己 } \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & \end{aligned}$ |  | $\stackrel{\Im}{〔}$ |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| M | HTh | TTh | Th | H | T | 0 - t | h | th | tth | hth | m |
|  |  |  |  |  |  | - |  |  |  |  |  |
|  |  |  |  |  |  | - |  |  |  |  |  |

## Measuring Smoothies

I can convert metric measures involving volume and capacity (litres and millilitres).
000

1) Match the measurements in millilitres with their equivalents in litres.

| 2700 ml |
| :---: |
| 4400 ml |
| 1950 ml |
| 7280 ml |
| 3406 ml |
| 3070 ml |


| 4.4 l |
| :---: |
| 7.28 l |
| 3.406 l |
| 3.07 l |
| 2.7 l |
| 1.95 l |

2) Multiply by 1000 to convert these measurements to millilitres.

| 2.6 l | 3.4 l | 5.7 l | 8.6 l | 3.25 l | 4.67 l | 6.53 l | 4.209 l | 7.05 l |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2600 ml |  |  |  | 32501 |  |  |  |  |

3) Divide by 1000 to convert these measurements to litres.

| 5600 ml | 2300 ml | 6800 ml | 4500 ml | 3450 ml | 7650 ml | 1240 ml | 4401 ml | 5060 ml |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 5.61 |  |  |  | 3.451 |  |  |  |  |

4) Decide whether to multiply or divide by 1000 to convert these measurements to litres or millilitres.

| 5.5 l | $\longrightarrow$ | $6450 \mathrm{ml} \xrightarrow{\longrightarrow}$ |  |
| :---: | :---: | :---: | :---: |
| 6.8 l | $\longrightarrow$ | 3.002 l |  |
| $3400 \mathrm{ml} \longrightarrow$ | 2.86 l |  |  |

5) Lucy's mum told her to use 6700ml of orange juice to make enough servings of her tropical smoothie to share with the class. However, Lucy's measuring jug only shows measurements in litres. Lucy thinks that 6700 ml is the same as 67 l . Is she right or wrong? Explain how you know.


## Measuring Smoothies Answers



## Measuring Smoothies

I can convert metric measures involving volume and capacity (litres and millilitres).
000

1) Some measurements have been given in millilitres, and some in litres. Decide whether to multiply or divide by 1000 to convert the measurements to the other unit.

| Litres | Millilitres | Litres | Millilitres |
| :---: | :---: | :---: | :---: |
| 3.5 l |  | 3.505 l |  |
|  | 2700 ml |  | 2005 ml |
| 8.45 l |  | 9.006 l |  |
|  | 2560 ml | 4.3 l |  |
| 3.05 l |  |  | 6820 ml |
|  | 4070 ml | 2.03 l |  |
|  | 4401 ml |  | 9600 ml |

2) Order these measurements from smallest to largest.
a) 3005 ml
3.551
3505 ml
3.0551

| Smallest |  |  |  |
| :--- | :--- | :--- | :--- |
|  |  |  | Largest |
|  |  |  |  |

b) 0.55 l
5.551
5005ml
5.35l
355 ml

| Smallest |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
|  |  |  |  | Largest |
|  |  |  |  |  |

3) Are these statements true or false? Tick the true statements and cross the false ones.

| $5500 \mathrm{ml}=5.5 \mathrm{l}$ | $\square$ | $4.3 \mathrm{l}=4030 \mathrm{ml}$ | $\square$ |
| :--- | :--- | :--- | :--- |
| $6.07 \mathrm{l}=6700 \mathrm{ml}$ | $\square$ | $2005 \mathrm{ml}=2.05 \mathrm{l}$ | $\square$ |

4) Hamish is making a fruit smoothie. He needs to make more than 31 to have enough to share with his friends. He adds 1.3 l of pineapple juice, 1550 ml of orange juice and 230 ml of mango juice. Does he have enough for all his friends?
$\qquad$
$\qquad$


## Measuring Smoothies Answers



## Measuring Smoothies

I can convert metric measures involving volume and capacity (litres and millilitres).
000

1) Some measurements have been given in millilitres, and some in litres.

Convert each measurement to the other unit.

| Litres | Millilitres | Litres | Millilitres |
| :---: | :---: | :---: | :---: |
| 3.5 l |  |  | 2700 ml |
| 3.55 l |  |  | 2707 ml |
| 3.505 l |  |  | 2077 ml |
| 3.05 l |  |  | 2007 ml |
| 3.005 l |  |  | 2070 ml |

2) Order these measurements from smallest to largest.
a) 0.25 l
5.7l
5002 ml
5.12l
500ml

| Smallest |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
|  |  |  |  | Largest |

b) 1.77 l
700ml
1.27l
0.071
1.077l
1700 ml

| Smallest |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  | Largest |
|  |  |  |  |  |  |

3) A cup has a capacity of 275 ml . A mug has a capacity of 450 ml . A jug has a capacity of 1.25l. Complete these statements using < or >.

| 10 cups | 3 mugs | 2 jugs |
| :---: | :---: | :---: |
| 5 mugs | 3 jugs | 20 cups |
| 5 jugs | 10 mugs | 15 cups |

4) Luca brought 3.56 l of apple juice to add to the fruit smoothies that they were making in class. Caitlin brought $3 \frac{3}{4}$ l of pineapple juice and Alexa brought 3056 ml of cranberry juice.
a) Who brought the most to drink?
b) Order the amounts that they brought to drink, from smallest to largest amount.
c) What is the difference, in millilitres, between the smallest and largest amount?
d) How much did they bring to drink in total? Give your answer in litres.

Measuring Smoothies Answers


| Lemonade | 0.76 litres | 0.5 litres + 0.26litres |
| :---: | :---: | :---: |
| Water | 809 ml | 0.4 litres + 409 ml |
| Apple juice | 1.405 litres | $1000 \mathrm{ml}+405 \mathrm{ml}$ |
| Orange juice | 1378 ml | 1 litres + 0.378litres |
| Cola | 2.01 litres | $2000 \mathrm{ml}+10 \mathrm{ml}$ |
| Cranberry juice | 0.6 litres | 0.5 litres + 100 ml |
| Coconut water | 754 ml | $\frac{3}{4}$ litre +0.004 litres |
| Pineapple juice | 999 ml | ${ }^{10}$ litre +99 ml |

1) Accept an explanation that shows that the statement is incorrect because the amount should be divided by 1000 to convert to litres and then multiplied by 6 . Alternatively, the amount could be multiplied by 6 and then divided by 1000.
2) Accept an explanation that shows that Meeta is incorrect. 0.04 litres is equal to 40 ml , not 4 ml . 1.25 litres is equal to 1250 ml , not 125 ml . The correct total is 3120 ml or 3.12 litres.
3) 



| Ingredients | Calculation | Volume in millilitres | Volume in litres |
| :--- | :--- | :--- | :--- |
| Cranberry juice, Pineapple juice and Coconut water | $0.7+0.32+0.35$ or $700+320+350$ | 1370 ml | 1.37 litres |
| Cranberry juice, Pineapple juice and Lemonade | $0.7+0.32+0.45$ or $700+320+450$ | 1470 ml | 1.47 litres |
| Cranberry juice, Pineapple juice and Apple juice | $0.7+0.32+0.13$ or $700+320+130$ | 1150 ml | 1.15 litres |
| Cranberry juice, Coconut water and Lemonade | $0.7+0.35+0.45$ or $700+350+450$ | 1500 ml | 1.5 litres |
| Cranberry juice, Coconut water and Apple juice | $0.7+0.35+0.13$ or $700+350+130$ | 1180 ml | 1.18 litres |
| Cranberry juice, Lemonade and Apple juice | $0.7+0.45+0.13$ or $700+450+130$ | 1280 ml | 1.28 litres |
| Pineapple juice, Coconut water and Lemonade | $0.32+0.35+0.45$ or $320+350+450$ | 1120 ml | 1.12 litres |
| Pineapple juice, Coconut water and Apple juice | $0.32+0.35+0.13$ or $320+350+130$ | 800 ml | 0.8 litres |
| Pineapple juice, Lemonade and Apple juice | $0.32+0.45+0.13$ or $320+450+130$ | 900 ml | 0.9 litres |
| Coconut water, Lemonade and Apple juice | $0.35+0.45+0.13$ or $350+450+130$ | 930 ml | 0.93 litres |

1) Complete the missing parts of these converted and partitioned smoothie ingredients.

| Lemonade | 0.76 litres | 0.5 litres $+\ldots \ldots$ litres |
| :---: | :---: | :---: |
| Water | 809 ml | 0.4 litres $+\ldots \ldots \mathrm{ml}$ |
| Apple juice | 1.405 litres | $1000 \mathrm{ml}+\ldots \mathrm{ml}$ |
| Orange juice | 1378 ml | 1 litres $+\ldots$ litres |
| Cola | 2.01 litres | $2000 \mathrm{ml}+\ldots \mathrm{ml}$ |
| Cranberry juice | 0.6 litres | $\frac{3}{4}$ litre $+\ldots$ litres |
| Coconut water | 754 ml | $\frac{9}{10}$ litre $+\ldots \quad \mathrm{ml}$ |
| Pineapple juice | 999 ml |  |

1) The capacity of this smoothie glass is 560 ml .

To show how much smoothie juice would be needed to fill six glasses, in litres, I divide 560 by 100 and then multiply by 6. Do you agree with this statement? Explain why.

2) Here are the volumes of four different smoothie ingredients.

| Pineapple juice | Coconut water | Apple juice | Orange juice |
| :---: | :---: | :---: | :---: |
| 1030 ml | 0.04 litres | 800 ml | 1.25 litres |

a) Meeta finds the total volume of all four smoothie ingredients using this calculation:

| 1 | 0 | 3 | 0 |  |
| ---: | ---: | ---: | ---: | ---: |
| 0 | 0 | 0 | 4 |  |
| 0 | 8 | 0 | 0 |  |
| + | 0 | 1 | 2 | 5 |
| 1 | 9 | 5 | 9 | ml |

Is Meeta correct or incorrect? Explain your answer.
b) Write two true statements and one false statement about the volumes of the four smoothie ingredients. Can your partner identify the incorrect statement?

1) Otto, Freddie, Anja and Grace have smoothies. They measure the volume of their drinks in measuring jugs. Use the clues to work out who each drink belongs to.

- Freddie's drink has the greatest volume.
- Anja's drink has the smallest volume.
- Otto's drink has a volume smaller than $\frac{2}{5}$ of a litre.


2) The children mix their own smoothies using three different ingredients.

Find the volumes of the ten possible smoothies they can make in both millilitres and litres using these ingredients.


| Ingredients | Calculation | Volume in millilitres | Volume in litres |
| :--- | :--- | :--- | :--- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1) Complete the missing parts of these converted and partitioned smoothie ingredients.

| Lemonade | $\begin{aligned} & 0.76 \\ & \text { litres } \end{aligned}$ | 0.5 litres + ___ litres |
| :---: | :---: | :---: |
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| Apple juice | $\begin{gathered} 1.405 \\ \text { litres } \end{gathered}$ | $1000 \mathrm{ml}+\ldots \mathrm{ml}$ |
| Orange juice | 1378ml | 1 litres + ___ litres |
| Cola | $\begin{aligned} & 2.01 \\ & \text { litres } \end{aligned}$ | $2000 \mathrm{ml}+\ldots \mathrm{ml}$ |
| Cranberry juice | 0.6 litres | 0.5 litres + __ ml |
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| 1030 ml | 0.04 litres | 800 ml | 1.25 litres |

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$$
\begin{array}{rrrrr}
1 & 0 & 3 & 0 & \\
0 & 0 & 0 & 4 & \\
0 & 8 & 0 & 0 & \\
+ & 0 & 1 & 2 & 5 \\
\hline 1 & 9 & 5 & 9 & \mathrm{ml} \\
\hline
\end{array}
$$

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