

## Year 5 maths – Summer 2 Week beginning: 22.6.20

Theme	<b>Lesson 4 of 8 Volume</b> To find the capacity of rectangular boxes	<b>Lesson 5 of 8 Volume</b> To compare and convert units of volume	<b>Lesson 6 of 8 Volume</b> To convert units of volume (metric and imperial)	<b>Lesson 7 of 8 Volume</b> To convert units of volume (metric and imperial)	<b>Lesson 8 of 8 Volume</b> To solve word problems involving volume
Factual fluency (to aid fluency)	Multiply 1-digit by 3 or 4-digit numbers <a href="#">activity</a>	Practise converting units of volume <a href="#">activity</a>	Practice converting imperial and metric measures <a href="#">activity</a>	Practise converting units of volume <a href="#">activity</a>	Practise volume <a href="#">activity</a>
<p><b>Problem/activity of the day</b></p> <p><b>Remember, just like in class, you can still show the depth of your knowledge <a href="#">LINK</a></b></p>	<p><b>(Lesson 1 resources below)</b> <b>MAKING LINKS:</b> Last week we found the volume of solids. Today we will be finding the capacity of boxes.</p> <p><b>THINK: (support below)</b> Can you help me with this problem? My friend says she can work out the volume of this square box in cm<sup>3</sup> and ml just by using the measurements shown on the net. How can she do this?</p> <p>Our problem is in the textbook on page 249. Look at it now.</p> <p><b>SEE: (model below)</b> Check the solution on page 250 of your textbook.</p> <p><b>DO:</b> Use what you have learnt today to solve: PART 1: Do questions 1 and 2 on page 251 of the textbook</p> <p>Check your answers below before moving on to: PART 2: Complete question 1, Chapter 13, worksheet 5, pages 162 of your workbook.</p> <p>Don't forget to include the unit of measurement in your answers!</p>	<p><b>(Lesson 2 resources below)</b> <b>MAKING LINKS:</b> Yesterday we found the capacity of boxes. Today we will be comparing and converting units of volume.</p> <p><b>THINK: (support below)</b> Can you help me with this problem? My friend is trying to compare the volume of different amounts of liquid. Some of the containers show the liquid in litres and millilitres with fractions and decimal numbers. Can you help convert them to make comparing them easier?</p> <p>Our problem is in the textbook on page 252. Look at it now.</p> <p><b>SEE: (model below)</b> Check the solutions for both methods on pages 252-253 of your textbook.</p> <p><b>DO:</b> PART 1: Do questions 1 to 4 from page 254 of the textbook.</p> <p>Check your answers below before moving on to: PART 2: Complete questions 1 and 3, Chapter 13, worksheet 6, pages 164 - 165 of the workbook.</p> <p>Don't forget to include the unit of measurement in your answers!</p>	<p><b>(Lesson 3 resources below)</b> <b>MAKING LINKS:</b> Yesterday we compared and converted units of volume. Today we will be converting metric and imperial units of volume.</p> <p><b>THINK: (support below)</b> Can you help me with this problem? My friend says pints are used to measure volume in other countries. If you know that 1 pint is about 568ml can you convert 4 pints into millilitres?</p> <p>Our problem is in the textbook on page 255. Look at it now.</p> <p><b>SEE: (model below)</b> Look at the different solutions on pages 255-256 of your textbook.</p> <p>Check here to recap the formal method from year 4 for <a href="#">multiplication</a>.</p> <p><b>DO:</b> PART 1: Do the questions on page 256 of the textbook.</p> <p>Check your answers below before moving on to: PART 2: Complete workbook, Chapter 13, Worksheet 7, on pages 166-167. <u>Not question 2C.</u></p> <p>Don't forget to include the unit of measurement in your answers!</p>	<p><b>(Lesson 4 resources below)</b> <b>MAKING LINKS:</b> Yesterday we converted units of volume. Today we will continue with that.</p> <p><b>THINK: (support below)</b> Can you help me with this problem? My friend needs to get 2 pints of milk for his mum but the cartons only come in 500 ml or 250ml. Can you help him convert the volume?</p> <p>Our problem is in the textbook on page 257. Look at it now.</p> <p>Check here to recap the formal method from year 4 for <a href="#">multiplication</a>.</p> <p><b>SEE: (model below)</b> Look at the solutions on pages 257-258 of your textbook.</p> <p>Watch the lesson <a href="#">video</a>.</p> <p><b>DO:</b> PART 1: Do the questions on page 258 of the textbook.</p> <p>Check your answers below before moving on to: PART 2: Complete workbook, Chapter 13, Worksheet 8 on page 168.</p>	<p><b>(Lesson 5 resources below)</b> <b>MAKING LINKS:</b> Yesterday we converted units of volume. Today we will solve problems involving volume.</p> <p><b>THINK: (support below)</b> Can you help me with this problem? Could you find how much mango juice there was at the beginning?</p> <p>Our problem is in the textbook on page 259. Look at it now.</p> <p><b>SEE: (model below)</b> Check the solution on page 260 of your textbook.</p> <p>Watch the lesson <a href="#">video</a>.</p> <p><b>DO:</b> PART 1: Do questions 1 and 2 on page 261 of the textbook.</p> <p>Check your answers below before moving on to: PART 2: Complete workbook, Chapter 13, Worksheet 9 on pages 169-172.</p>
Methods, tips, clues & checks	Day 1 resources and answers (below)	Day 2 resources and answers (below)	Day 3 resources and answers (below)	Day 4 resources and answers (below)	Day 5 resources and answers (below)

**See below for resources to support you to THINK-SEE-DO**

## DAY 1 RESOURCES:

**THINK:** Our problem is on textbook page 249.

My friend says she can work out the volume of this square box in  $\text{cm}^3$  and ml just by using the measurements shown on the net. How can she do this?

**DO:** Use what you have learnt today to solve:

**PART 1:** Do questions 1 and 2 on page 251 of the textbook.

Check your answers below before moving on to:

**PART 2:** Complete **question 1**, Chapter 13, worksheet 5, pages 162 of your workbook.

Don't forget to include the unit of measurement in your answers!

### **DEEPENING:**

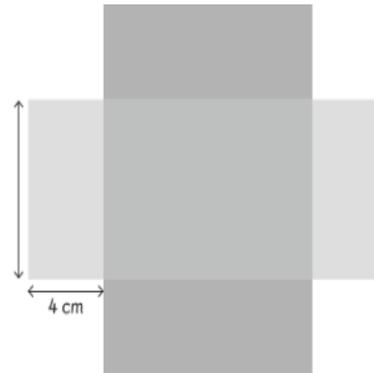
Create a guide explaining how you find the volume of a cube or cuboid.

You must include:

- a drawing of a cuboid with appropriate measurements labelled
- an explanation of the meaning of **volume = width x length x height**

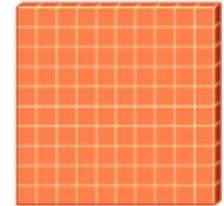
Share your finished work with your teacher.

**SEE:** Look at the different ways to solve the problem on page 250 of your textbook.



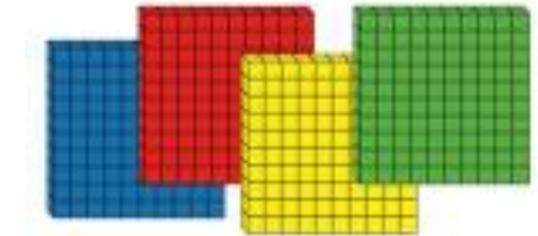
There are 10 rows of 10 cubes on the base of the box.

Each cube is  $1\text{cm}^3$ .  
The base of the box is  **$10 \times 10\text{cm}^3$** .



The height of the box is 4cm.  
We can fit in **4 layers of cubes** into the box.

The volume of the box is:  
 **$10 \times 10\text{cm}^3 \times 4 = 400\text{cm}^3$**



Remember, **volume = width x length x height**

You can work out how many cubes there are in each layer by multiplying the number of cubes in the **width** by the number of cubes in the **length**.

Then multiply the amount of cubes in each layer by the number of layers (its **height**).

If we were to pour sand or liquid into the box we would find that 400ml would fit into it. So  **$1\text{cm}^3 = 1\text{ml}$**

## DAY 2 RESOURCES:

**THINK:** Our problem is in the textbook on page 252.

My friend is trying to compare the volume of different amounts of liquid. Some of the containers show the liquid in litres and millilitres with fractions and decimal numbers. Can you help to convert them to make comparing them easier?

**DO:** Use what you have learnt today to solve:

**PART 1:** Do questions 1 to 4 from page 254 of the textbook.

Check your answers below before moving on to:

**PART 2:** Complete **questions 1 and 3**, Chapter 13, worksheet 6, pages 164 - 165 of the workbook.

Don't forget to include the unit of measurement in your answers!

### **DEEPENING:**

Complete **question 4**, Chapter 13, worksheet 6, page 165 of the workbook

**SEE:** Check the solution on pages 252-253 of your textbook.

We have three amounts:

One container is written in millilitres: **1020ml**

One container is written as a decimal: **1.2litres**

One container is written with a fraction:  **$1\frac{2}{5}$  litre**

What have we learnt in year 4 and year 5 that could help us solve this problem?

- comparing the three amounts would be easier if we convert them to the same type of unit of measure.
- we can use  $1000\text{ml} = 1 \text{ litre}$  to work out other amounts such as  $100\text{ml} = 0.1 \text{ litre}$  and  $10\text{ml} = 0.01 \text{ litre}$ , or  $20\text{ml} = 0.02 \text{ litre}$ .
- when converting millilitres to litres we divide by 1000.
- when converting litres to millilitres we multiply by 1000.
- we can convert fifths to tenths and tenths to a decimal number.
- using a place value chart can support us to multiply and divide by a thousand and to show tenths as a decimal number (for example  $\frac{4}{10} = 0.4$ ).

Thousands	Hundreds	Tens	Ones	●	Tenths	Hundredths

### DAY 3 RESOURCES:

**THINK:** Our problem is in the textbook on page 255.

My friend says pints are used to measure volume in other countries. If you know that 1 pint is about 568ml can you convert 4 pints into millilitres?

**DO:** Use what you have learnt today to solve:

PART 1: Do the questions on page 256 of the textbook.

Check your answers below before moving on to:

PART 2: Complete workbook, Chapter 13, Worksheet 7, on pages 166-167. DO NOT DO QUESTION 2C.

### **DEEPENING:**

Have a look at the sets of four quantities below. Can you rank them in order from smallest to largest?

To help you to decide on your rankings, you may need to find extra information or carry out some experiments.

#### **Volume of water**

- In a half-filled bath
- Used in a 10 minute shower
- Used in 5 dishwasher cycles
- Used to flush the toilet 20 times

**SEE:** Look the different solutions on pages 255-256 of your textbook.

Check here to recap the formal method from year 4 for [multiplication](#).

$$\begin{array}{r} 568 \\ \times 4 \\ \hline 2272 \end{array}$$

1 pint in millilitres  $\approx$  568ml

4 pints in millilitres  $\approx$  **4 x 568ml = 2272ml**

Remember the symbol  $\approx$  means 'approximately'

$$100 \text{ ml} = 0.1 \text{ l}$$

$$200 \text{ ml} = 0.2 \text{ l}$$

$$10 \text{ ml} = 0.01 \text{ l}$$

$$70 \text{ ml} = 0.07 \text{ l}$$

$$1 \text{ ml} = 0.001 \text{ l}$$

$$2 \text{ ml} = 0.002 \text{ l}$$

We can convert millilitres to litres using a place value chart to support our division by 1000 or we can use known facts, such as 2ml = 0.002 litres.

$$2272\text{ml} \div 1000 = 2.272 \text{ litres}$$

Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
2	2	7	2			

A place value chart also helps us to estimate millilitres to the nearest 10ml. Remember; the **ones number** tells us whether to round up or down.

$$2272\text{ml rounds to } 2270\text{ml.}$$

#### DAY 4 RESOURCES:

**THINK:** Our problem is in the textbook on page 257.

My friend needs to get 2 pints of milk for his mum but the cartons only come in 500 ml or 250ml.

Can you help him convert the volume?

**DO:** Use what you have learnt today to solve:

PART 1: Do the questions on page 258 of the textbook.

Check your answers below before moving on to:

PART 2: Complete workbook, Chapter 13, Worksheet 8 on page 168.

#### **DEEPENING:**

Maya has two glasses of water. Watch the video clip.

<https://nrich.maths.org/13664>

What do you think will happen next?

Click on the 'Show' button to see the full clip and find out.

Are you surprised by the result?

Can you explain what is going on?

**SEE:** Look at the solutions on pages 257-258 of your textbook.

Watch the lesson [video](#).

Check here to recap the formal method from year 4 for [multiplication](#).

$$\begin{array}{r} 568 \\ \times \quad 2 \\ \hline 1136 \\ \hline \end{array}$$

Remember 1 pint in millilitres  $\approx$  568ml  
so 2 pints  $\approx$  2 x 568ml

We are trying to get 'about 2 pints'  
using the cartons containing 500ml  
and 250ml.

$$500\text{ml} + 500\text{ml} + 250\text{ml} = 1250\text{ml}$$

2 large cartons and 1 small carton of milk would be enough milk  
if we needed 'about 2 pints'.

Estimating the amounts could help us.

We could round 1 pint of milk to estimate the amount we need.

$$568\text{ml} \approx 600\text{ml}$$

$$2 \times 600\text{ml} = 1200\text{ml} \text{ (that would be **more than 2 pints**)}$$

This would be more useful than rounding the final amount as  
 $1136\text{ml} \approx 1100\text{ml}$  (that would be **less than 2 pints**).

If we think logically at the start, we know we will have to get  
more than 1136ml as both the cartons come in amounts that  
are multiples of 10 (500ml and 250ml) and the amount we are  
trying to reach has **6 ones** (113**6**ml).

## DAY 5 RESOURCES:

**THINK:** Our problem is in the textbook on page 259.

Could you find how much mango juice there was at the beginning?

**DO:** Use what you have learnt today to solve:

PART 1: Do questions 1 and 2 on page 261 of the textbook.

Check your answers below before moving on to:

PART 2: Complete workbook, Chapter 13, Worksheet 9 on pages 169-172.

### **DEEPENING:**

Complete worksheet 10 in your workbook, pages 173-176.

**SEE:** Check the solution on page 260 of your textbook.

Watch the lesson [video](#).

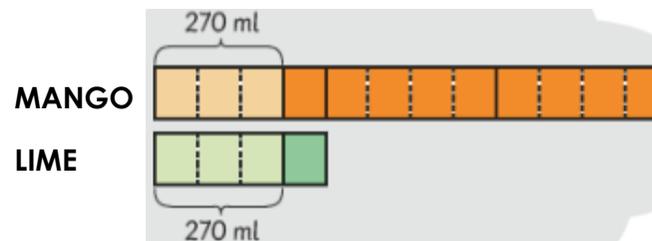
Draw a bar model to show the problem.

The first bit of important information is that there is 3 times as much mango juice as lime juice.

In the beginning: Mango juice is 3 times the amount of lime juice.



At the end: **After using 270ml of both juices**, the mango juice was 9 times the amount of lime juice so our mango bar is now made of 270ml + 9 units.



If we divide the mango bar up to show 270ml + 9 units we can see that there were 12 units of mango juice at the start and we can use that to calculate 1 unit.

$$270 \text{ ml} = 3 \text{ units}$$

$$1 \text{ unit} = 270 \div 3 = 90, \text{ so } 1 \text{ unit} = 90 \text{ ml.}$$

$$12 \times 90 \text{ ml} = 1080 \text{ ml} = 1 \text{ litre } 80\text{ml}$$

## ANSWERS – part 1:

<u>Day 1</u>	<u>Day 2</u>	<u>Day 3</u>	<u>Day 4</u>	<u>Day 5</u>
<p><u>Part 1:</u> Q.1: a) 1350ml, b) 810ml, c) 729ml</p> <p>Q.2: a) 9000 cm<sup>3</sup>, b) 7 x 5 x 3 = 105 cubes</p>	<p><u>Part 1:</u> Q.1: 1litre 65ml Q.2: 1.136 litre Q.3: 1 litre 750ml (1750ml) Q.4: 3 litre 600ml (3600ml)</p>	<p><u>Part 1:</u> Q.1: 1140ml Q.2: 430ml</p>	<p><u>Part 1:</u> Q.1: a) 1 x 500ml and 1 x 250ml b) 8 x 500ml</p> <p>Q.2: 7 x 250ml containers are needed</p>	<p><u>Part 1:</u> Q.1: Before: 1650ml After: 2200ml</p> <p>Q.2: Before: 2970ml After: 3520ml</p>

## ANSWERS – part 2 and deepening:

<u>Day 1</u>	<u>Day 2</u>	<u>Day 3</u>	<u>Day 4</u>	<u>Day 5</u>
<p><u>Part 2:</u> Workbook, Q.1: a) 160cm<sup>3</sup>, b) 90 cm<sup>3</sup>, c) 144cm<sup>3</sup></p> <p><b><u>DEEPENING:</u></b> Answers will vary. Share your work with your teacher.</p>	<p><u>Part 2:</u> Workbook, Do not do question 2. Question 4 is a deepening question.</p> <p>Q.1: a) 1litre 425ml = 1.425 litres, b) 4litres 300ml = 4.3 litres c) 2litres 910ml = 2.91litres</p> <p>Q.3: a) 1600ml, b) 4005ml, c) 1750ml, d) 3800ml, e) 2075ml, f) 5880ml</p> <p><b><u>DEEPENING:</u></b> Q.4: a) <math>2\frac{4}{5}</math>litre, 2.75litre, <math>2\frac{7}{10}</math> litre, 2.62litre b) <math>4\frac{5}{8}</math>litre, 4.56 litre, 4123ml, 4litres 68ml</p>	<p><u>Part 2:</u> Workbook, Q.1: a) 3 x 568ml = 1704ml = 1700ml b) 7 x 568ml = 3976ml = 3980ml c) 0.25 x 568ml = 142ml = 140ml</p> <p>Q.2: a) 2.8 litres b) 2.6 litres d) 3.1 litres</p> <p><b><u>DEEPENING: (answers may vary)</u></b> - a 10 minute shower approx. <b>90 litres</b> - a half-filled bath approx. <b>100 litres</b> - 5 dishwasher cycles approx. <b>100 litres</b> - to flush the toilet 20 times approx. <b>120 litres</b> (modern toilet)</p>	<p><u>Part 2:</u> Workbook, Q.1: a) 29, b) 12, c) 9, d) 6</p> <p><b><u>DEEPENING:</u></b> Check the answers other children came up with. Was your answer similar?</p> <p><a href="https://nrich.maths.org/13664/solution">https://nrich.maths.org/13664/solution</a></p>	<p><u>Part 2:</u> Workbook, Q.1: 150 x 5 = 750 There was 750ml to start with.</p> <p>Q.2: 900ml x 6 = 5400ml = 5 litres 400ml = 5.4 litres</p> <p>Q.3: 80ml x 9 = 720ml There was 720ml to start with.</p> <p>Q.4: 234ml x 8 = 1872ml She poured 1872ml to begin with.</p> <p><b><u>Deepening:</u></b> Q.1: 1168ml Q.2: 1183ml Q.3: 0.3 x 5 = 1.5litres Q.3: 2090 cm<sup>3</sup></p>