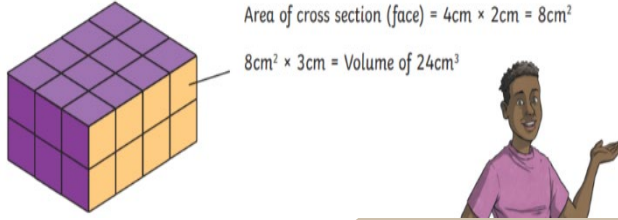
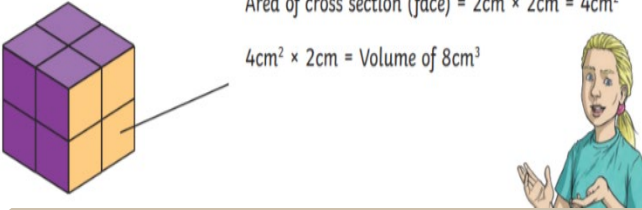
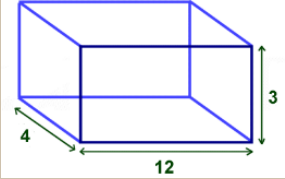
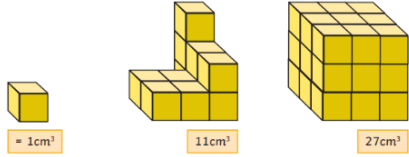



SUMMER TERM OVERVIEW YEAR 5 – Maths

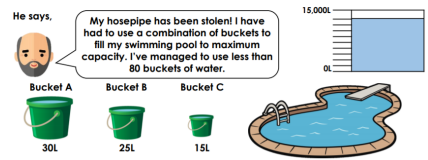
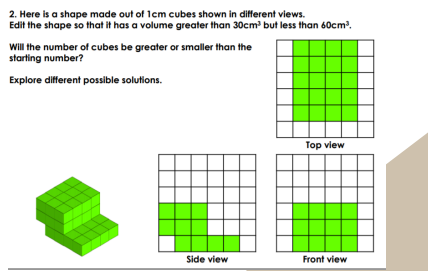
Term 3 Book – Mortal Engines

Block 3 -Topic: Measurement: Volume		Guide Time = 1 Weeks
Assessment:	WRMH End of block / term assessments Weekly Arithmetic Tests / Skills checks NFER Spring assessments. Daily retention activities / quizzes to ensure children are revisiting prior learning.	Very Important Points (VIPs): Volume is the amount of solid space something takes up Volume and capacity are different – capacity relates to the amount a container can hold
Links to prior learning (sequencing) and canon book	Canon Book – <i>Mortal Engines</i> Children will have prior knowledge of finding the area and perimeter of shapes. They will know how to calculate area and the formula needed for this. Children will have used measures (ml/L/cm/m) They will have an understanding of cubed numbers and that cube represent 3 numbers multiplied together.	To calculate volume : Length x width x height
Links to other learning (cross fertilisation)	<u>DT</u> – children will apply their knowledge of perimeter and area and volume. <u>Active Maths</u> - provide additional maths questions / problems based around perimeter, area and volume. Consolidate and teach further concepts in an active way, which allows children to apply their knowledge and understanding mentally at another time / lesson. <u>Geography</u> – Links to water cycle and volume of water/ evaporation rates / average rainfall. <u>Thematic Questions:</u> <u>The World Beyond Us:</u> How will volume be useful in the space shuttles in space? <u>The World Around Us:</u> How is volume used around the world in different jobs? <u>Modern Britain:</u> How do modern engineers use volume to benefit their work and improve Britain? <u>Healthy Bodies & Healthy Minds:</u> How can volume help maintain a healthy weight? <u>Culture:</u> How was volume measured in different times in history? <u>Technology in Action:</u>	  $12 \times 4 \times 3 = 84 \text{ cm}^3$ 

	<p>How does knowing how to calculate volume help with the creation of different machines?</p>	<p>If the shape is made of cubic cm blocks, you can count the cubes to find the shape's volume.</p>
<p>Links to future learning</p>	<p>The skills and knowledge taught in this block will be built upon and deepened throughout the year and continue to provide a secure platform for area and volume, with clear, imperative links to real-life contexts, which allow children to reason. Children will have a secure understanding of measurement and calculating in a range of contexts, which they are able to apply to Year 6 mathematical learning and beyond.</p>	<p>You only need to know one side to figure out the volume of a cube.</p> 
<p>Character/Wider Development ('50 things', cultural capital, skills)</p>	<p>Relate and use this knowledge and understanding in real-life contexts and make these relevant and purposeful links: Children can explore their school grounds: the size of the whole grounds and then each area. Children could then apply their mathematical understanding here to design new areas. This process can be applied to that of their home and garden. <u>Visit a person in their place of work:</u> children could research and visit a range of people in their place of work, which links to the use of volume i.e. a factory when packaging is made looking at the dimensions. <u>To cook a meal:</u> Reading labels, instruments for measuring capacity and non-standard measures of capacity to a matching exercise, reading scales and choosing litres or millilitres</p>	<p>The units of measure for volume are cubic units. Volume is in three-dimensions. You can multiply the sides in any order. Which side you call length, width, or height doesn't matter. You can estimate volume of different shapes by using similar shapes</p>  <p>Capacity is the total amount of fluid that can be contained in a container. It is the word we use when we are measuring liquids. Capacity is measured in L and ML There are 1000ml in 1L</p> <p><u>FAT questions</u></p> <p>How could post-apocalyptic worlds benefit from using volume when recreating their cities?</p> <p>In what ways could using volume help build defences to stop predators?</p> <p>How have architects and engineers used volume and capacity to design and build the new Aspire leisure complex in Pontefract?</p>

OVERVIEW OF TEACHING SEQUENCE

Key Facts / Learning	Learning Focus or Key Question	Learning Outcomes (NC)	Key Words/ Vocabulary	Greater Depth/SEND	Misconceptions	Activities and Resources
Measurement: Volume and capacity	<p>What is volume?</p> <p>To compare volume</p> <p>To estimate volume</p> <p>To estimate capacity</p>	<p>To understand what volume is and how to calculate volume</p> <p>Children use their understanding of volume to compare and order different solids</p> <p>To choose the most suitable measure of different objects in order to estimate volume</p> <p>To choose the most suitable measure of different objects in order to estimate volume capacity</p>	<p>Estimate Volume</p> <p>Compare Amount</p> <p>Space Capacity</p> <p>Different Centimetre cubes</p> <p>Greater smaller</p> <p>Liquid Solid</p> <p>Difference Amount</p> <p>Container Full Empty Half</p>	<p>GD:</p> <p>Use of real-life contexts should always be used to support all children's learning as they are able to see the relevance and purpose of this learning and apply it to an 'everyday' situation.</p> <p>Extend children using the editable WRM reasoning and problem solving resources (click here). Ensure children use mathematical vocabulary to support and further their understanding and reasoning</p> <p>NCETM and the National Stem Centre E-library have extension activities and challenges to suit each strand of maths linking to real life contexts. Rich have many different open ended challenges to further encourage critical thinking (click here)</p> <p>SEND: Ensure QLA / diagnostic test has been completed prior to units being taught, consider the use of pre-</p>	<p>Volume is to do with sound level</p> <p>Volume and capacity are the same</p> <p>Children are unsure of which units to use and they do not understand the importance of the units</p> <p>Children are unsure of what they are actually measuring</p> <p>Children thinking the larger the container the more water it may have in when they could be the same</p> <p>Errors when reading scales accurately</p>	<p>Pre-teaching of key concepts to allow students to commence tasks immediately within lessons.</p> <p>Recapping key concepts and ensuring children are revisiting prior learning is essential. WRM flashback is a useful support for children at the beginning of sessions, allowing misconceptions to be addressed</p> <p>WRM – click here</p> <p>WRM flashback - click here</p> <p>Classroom secrets – click here</p> <p>Maths frame – click here</p> <p>Third Space Learning – click here</p> <p>NCETM – click here</p> <p>NRICH – click here</p> <p>Example of DTM</p>

				<p>teaching videos (click here) and the support booklets</p> <p>SEND: Ensure QLA / diagnostic test has been completed prior to units being taught, consider the use of pre-teaching videos (click here)</p> <p>Pupils to have concrete resources such as cubes and measuring cups and resources to support their understanding.</p> <p>Giving children opportunities to apply their understanding to real life concrete situations Incorporate the use of ICT through games to understand the concepts (click here)</p> <p>Ensure pupils have a secure knowledge of key number skills (efficient multiplication) and that these are engrained in their memory and are practised to ensure fluency.</p>		<p>1. Gordon is filling up his swimming pool with fresh water after cleaning it out. His pool has a maximum capacity of 15,000L. The current water level is shown below.</p>  <p>He says, "My hosepipe has been stolen! I have had to use a combination of buckets to fill my swimming pool to maximum capacity. I've managed to use less than 80 buckets of water."</p> <p>Bucket A: 30L, Bucket B: 25L, Bucket C: 15L</p> <p>Explore the different combinations of buckets Gordon could have used to fill his pool to maximum capacity. He must use at least one of each bucket.</p> <p>2. Here is a shape made out of 1cm cubes shown in different views. Edit the shape so that it has a volume greater than 30cm³ but less than 60cm³. Will the number of cubes be greater or smaller than the starting number? Explore different possible solutions.</p> 
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Context (big picture learning):

Mathematics is an important, creative discipline that helps us to understand and change the world. We want all of our children within the Ponfrac Academies Trust to experience all that mathematics has to offer and to develop a sense of curiosity about the subject with a clear understanding. When they leave us we want them to continue their love of maths and use it continuously and positively in their future lives.

We foster a positive 'growth mind-set' attitude and we promote the fact that we believe that all children can achieve in mathematics. We teach for secure and deep understanding of mathematical concepts through manageable, bespoke steps and cross fertilize at every opportunity. VIPs (Very Important Points) are implemented in every lesson to ensure knowledge and skills are revisited and retained over time.

We use mistakes and misconceptions as an essential part of learning and provide challenge through rich and sophisticated reasoning and problem-solving activities. At our school, the majority of children will be taught the content from their year group only. They will spend time becoming true masters of content, applying and being creative with new knowledge in multiple ways.

folder name and link to resources: Trust shared > Primaries > Departments > KS2 > Planning Cycle B > summer>Mortal Engines> Maths > Year 5>Volume

Year 5 Knowledge Organiser: Volume

FAT questions

How could post-apocalyptic worlds benefit from using volume when recreating their cities?

In what ways could using volume help build defences to stop predators?

How have architects and engineers used volume and capacity to design and build the new Aspire leisure complex in Pontefract?

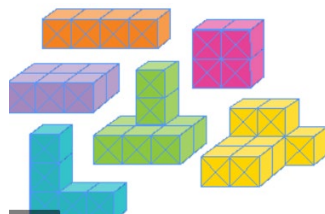
Key vocabulary

Estimate
 Volume
 Compare
 Amount
 Space
 Capacity
 Different
 Centimetre cubes
 Greater smaller
 Liquid
 Solid
 Difference
 Amount

To see the full list of vocabulary please refer to our resource walls

Intent

We aim to progress our skills in calculating volume and capacity in order to equip us with the skills needed to solve real world problems that require a mathematical solution



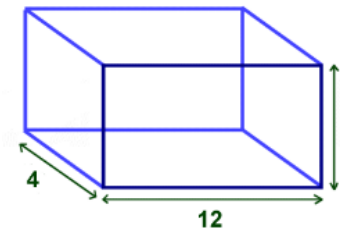
VIPs (Very Important Points)

Volume is the amount of solid space something takes up

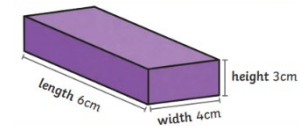
Volume and capacity are different – capacity relates to the amount a container can hold

To calculate volume = Length x Width x Height

$$12 \times 4 \times 3 = 84\text{cm}^3$$



length \times width \times height = volume of a cuboid



Multiply dimensions in **any** order:

$$3\text{cm} \times 6\text{cm} \times 4\text{cm}$$

$$\text{volume} = 72\text{cm}^3$$

If the shape is made of cubic cm blocks, you can count the cubes to find the shape's **volume**.

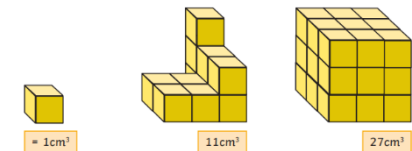
You only need to know one side to **figure out** the **volume** of a cube.

The units of **measure** for **volume** are cubic units.

Volume is in three-dimensions.

You can multiply the sides in any order.

Which side you call length, width, or height doesn't matter



Capacity is the total amount of fluid that can be contained in a container. It is the word we use when we are measuring **liquids**