Unit 2 Reveal Grade 5

Content Area: **Math**
Course(s): **Math**
Time Period: **September**
Length: **2 weeks**
Status: **Published**

Unit overview

UNIT 2 PLANNER
Volume

PACING: 10 days

LESSON		MATH OBJECTIVE	LANGUAGE OBJECTIVE	SOCIAL AND EMOTIONAL LEARNING OBJECTIVE	LESSON	KEY VOCABULARY
Unit Opener	Painted Cubes	Students use connecting cubes to build a cube. They relate what they build to volume.				
2-1	Understand Volume	Students understand volume is a measurable attribute of 3-dimensional figures. Students understand that a rectangular prism can be packed using unit cubes with no gaps or overlaps to establish volume.	• Students talk about ways to measure volume using the verb *find*.	Students use prior knowledge and new understanding of mathematical concepts to complete a task, building stronger self-efficacy.	2-1	Math Terms rectangular prism unit cube volume
2-2	Use Unit Cubes to Determine Volume	Students determine the volume of a rectangular prism by counting unit cubes. Students determine the volume of a retangular prism by multiplying the number of unit cubes in one layer by the number of layers.	• Students discuss how to determine the volume of any 3-dimensional solid by counting unit cubes while answering *Wh-* questions.	Students exchange ideas for mathematical problem-solving with a peer, listening attentively and providing thoughtful and constructive feedback.	2-2	cubic unit unit cube volume
2-3	Use Formulas to Determine Volume	Students determine the volume of rectangular prisms using formulas.	• Students explain how to determine the volume of rectangular prisms using formulas while answering *Wh-* and Yes/No questions and using the term *dimensions*.	Students practice strategies for persisting at a mathematical task, such as setting a small goal or setting timers for remaining focused.	2-3	base (of a solid) formula
Math Probe	**Volume of Rectangular Prisms**	Gather data on students' understanding of determining volume of rectangular prisms.				
2-4	Determine Volume of Composite Figures	Students determine the volume of composite solid figures.	• Students discuss how to determine the volume of composite solid figures while answering *Wh-* questions.	Students engage in active listening and work collaboratively with a partner to complete mathematical tasks.	2-4	composite solid figure formula
2-5	Solve Problems Involving Volume	Students apply the volume formulas to solve real-world problems involving rectangular prisms.	• Students talk about applying the volume formula to solve real-world problems using the adjective *given*.	Students determine the strategies and analyses necessary to make informed decisions when engaging in mathematical practices.	2-5	equation formula unknown variable
Unit Review **Fluency Practice**						
Unit Assessment **Performance Task**						

Enduring Understandings

See Above.

Essential Questions

See Above.

Instructional Strategies and Learning Activities

LESSON 2-1

Understand Volume

Learning Targets

- I can describe volume as an attribute of solid figures.
- I can describe how rectangular prisms can be packed using unit cubes with no gaps or overlaps.

Standards ◆ Major ▲ Supporting ● Additional

Content

◇ **5.MD.C** Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

◇ **5.MD.C.3** Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

◇ **5.MD.C.3.a** A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.

Mathematical Practices and Processes

MPP Attend to precision.

MPP Look for and make use of structure.

Focus

Content Objective	Language Objectives	SEL Objective
• Students understand volume is a measurable attribute of 3-dimensional figures. • Students understand that a rectangular prism can be packed using unit cubes with no gaps or overlaps to establish volume.	• Students talk about ways to measure volume using the verb *find*. • In order to support sense-making and maximizing linguistic, ELs will participate in MLR2: Collect and Display.	• Students use prior knowledge and new understanding of mathematical concepts to complete a task, building stronger self-efficacy.

Coherence

Previous	Now	Next
• Students described area as an attribute of plane figures and explained concepts of area measurement (Grade 3).	• Students describe volume as an attribute of solid figures and understand concepts of volume measurement.	• Students measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units (Unit 2). • Students find the volume of a right rectangular prism with fractional edge lengths (Grade 6).

Rigor

Conceptual Understanding	Procedural Skill & Fluency	Application
• Students develop understanding of volume as the amount of space taken up by a solid object.	• Students develop proficiency with determining volume. *Procedural skill and fluency is not a targeted element of rigor for this standard.*	• Students apply their understanding of volume in different situations. *Application is not a targeted element of rigor for this standard.*

LESSON 2-2

Use Unit Cubes to Determine Volume

Learning Targets

- I can determine volume by counting unit cubes that fill a solid with no gaps or overlaps.
- I can determine volume by multiplying the number of unit cubes in one layer by the number of layers that fill a solid with no gaps or overlaps.

Standards ◆ Major ▲ Supporting ● Additional

Content

◇ **5.MD.C.3.a** A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.

◇ **5.MD.C.3.b** A solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of *n* cubic units.

◇ **5.MD.C.4** Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

Math Practices and Processes

MPP Look for and make use of structure.

Focus

Content Objective	Language Objectives	SEL Objective
• Students determine the volume of a rectangular prism by counting unit cubes. • Students determine the volume of a rectangular prism by multiplying the number of unit cubes in one layer by the number of layers.	• Students discuss how to determine the volume of any 3-dimensional solid by counting unit cubes while answering *Wh-* questions. • In order to support optimizing output, ELs will participate in MLR3: Critique, Correct, and Clarify.	• Students exchange ideas for mathematical problem-solving with a peer, listening attentively and providing thoughtful and constructive feedback.

Coherence

Previous	Now	Next
• Students described volume as an attribute of solid figures and understood concepts of volume measurement (Unit 2).	• Students measure volume by packing prisms with unit cubes then counting, using cubic cm, cubic in, cubic ft, and improvised units.	• Students use two formulas to determine the volume of a right rectangular prism with whole-number side lengths (Unit 2).

Rigor

Conceptual Understanding	Procedural Skill & Fluency	Application
• Students understand that the volume of a right rectangular prism can be determined by counting the number of unit cubes that fill it completely with no gaps or overlaps.	• Students build proficiency in determining volume using multiplication.	• Students start to recognize the relationship between the dimensions of a rectangular prism and how many unit cubes it takes to pack it *Application is not a targeted element of rigor for this standard.*

LESSON 2-3

Use Formulas to Determine Volume

Learning Targets

- I can find the volume of rectangular prisms using formulas.
- I can explain how to find the volume of rectangular prisms using formulas.

Standards ◆ Major ▲ Supporting ● Additional

Content

◇ **5.MD.C.5.a** Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.

◇ **5.MD.C.5.b** Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real-world and mathematical problems.

Mathematical Practices and Processes

MPP Model with mathematics.

Focus

Content Objective	Language Objectives	SEL Objective
• Students determine the volume of rectangular prisms using formulas.	• Students explain how to determine the volume of rectangular prisms using formulas while answering *Wh-* and Yes/No questions and using the term *dimensions*. • In order to support cognitive meta-awareness and optimize output, ELs will participate in MLR1: Stronger and Clearer Each Time.	• Students practice strategies for persisting at a mathematical task, such as setting a small goal or setting timers for remaining focused.

Coherence

Previous	Now	Next
• Students measured volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units (Unit 2).	• Students use formulas to determine the volume of a right rectangular prism with whole-number side lengths.	• Students determine the volume of composite solid figures (Unit 2).

Rigor

Conceptual Understanding	Procedural Skill & Fluency	Application
• Students use their understanding of volume to develop the formula used to calculate the volume of rectangular prisms.	• Students build proficiency in calculating the volume of rectangular prisms.	• Students apply the formulas for volume of a rectangular prism to solve real-world problems.

LESSON 2-4

Determine the Volume of Composite Figures

Learning Targets

- I can find the volume of composite figures.
- I can explain how to find the volume of composite figures.

Standards ◆ Major ▲ Supporting ● Additional

Content

◇ **5.MD.C.5.c** Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

Mathematical Practices and Processes

MPP Reason abstractly and quantitatively.

MPP Model with mathematics.

Focus

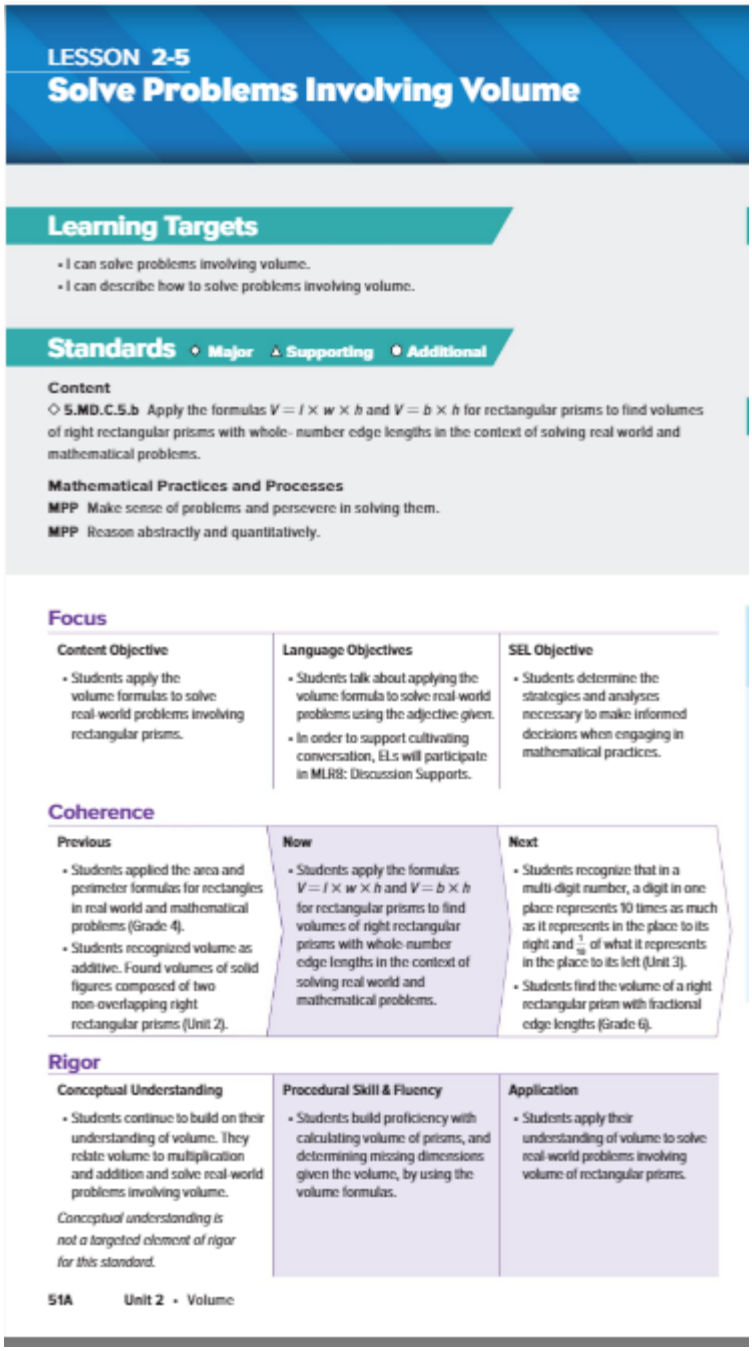
Content Objective	Language Objectives	SEL Objective
• Students determine the volume of composite solid figures.	• Students discuss how to determine the volume of composite solid figures while answering *Wh-* questions. • In order to support optimizing output, ELs will participate in MLR5: Co-Craft Questions and Problems.	• Students engage in active listening and work collaboratively with a partner to complete mathematical tasks.

Coherence

Previous	Now	Next
• Students found and used two formulas to determine the volume of a right rectangular prism with whole-number side lengths (Unit 2).	• Students recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms.	• Students apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole- number edge lengths in the context of solving real world and mathematical problems (Unit 2).

Rigor

Conceptual Understanding	Procedural Skill & Fluency	Application
• Students build on their understanding of volume by decomposing composite figures to calculate volume. They recognize that volume is additive and to calculate the volume of the composite figure, the volumes of each part must be added.	• Students build proficiency with calculating volumes of rectangular prisms by using the volume formulas.	• Students build proficiency with calculating volumes of rectangular prisms by using the volume formulas.



LESSON 2-5

Solve Problems Involving Volume

Learning Targets

- I can solve problems involving volume.
- I can describe how to solve problems involving volume.

Standards ◆ Major ▲ Supporting ● Additional

Content

◇ **5.MD.C.5.b** Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole- number edge lengths in the context of solving real world and mathematical problems.

Mathematical Practices and Processes

MPP Make sense of problems and persevere in solving them.

MPP Reason abstractly and quantitatively.

Focus

Content Objective

- Students apply the volume formulas to solve real-world problems involving rectangular prisms.

Language Objectives

- Students talk about applying the volume formula to solve real-world problems using the adjective given.
- In order to support cultivating conversation, ELs will participate in MLR8: Discussion Supports.

SEL Objective

- Students determine the strategies and analyses necessary to make informed decisions when engaging in mathematical practices.

Coherence

Previous

- Students applied the area and perimeter formulas for rectangles in real world and mathematical problems (Grade 4).
- Students recognized volume as additive. Found volumes of solid figures composed of two non-overlapping right rectangular prisms (Unit 2).

Now

- Students apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.

Next

- Students recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $\frac{1}{10}$ of what it represents in the place to its left (Unit 3).
- Students find the volume of a right rectangular prism with fractional edge lengths (Grade 6).

Rigor

Conceptual Understanding

- Students continue to build on their understanding of volume. They relate volume to multiplication and addition and solve real-world problems involving volume.

Conceptual understanding is not a targeted element of rigor for this standard.

Procedural Skill & Fluency

- Students build proficiency with calculating volume of prisms, and determining missing dimensions given the volume, by using the volume formulas.

Application

- Students apply their understanding of volume to solve real-world problems involving volume of rectangular prisms.

51A Unit 2 • Volume

Integration of Career Readiness, Life Literacies and Key Skills

PFL.9.1.2. FI.1	Differentiate the various forms of money and how they are used (e.g., coins, bills, checks, debit and credit cards).
PFL.9.1.2.PB.2	Explain why an individual would choose to save money.
WRK.9.2.5.CAP.1	Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.
WRK.9.2.5.CAP.2	Identify how you might like to earn an income.
WRK.9.2.5.CAP.3	Identify qualifications needed to pursue traditional and non-traditional careers and

	occupations.
WRK.9.2.5.CAP.4	Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.
TECH.9.4.8.CI.1	Assess data gathered on varying perspectives on causes of climate change (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).
TECH.9.4.8.CI.4	Explore the role of creativity and innovation in career pathways and industries.
TECH.9.4.8.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).
TECH.9.4.8.CT.3	Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome.
TECH.9.4.8.DC.2	Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8).
TECH.9.4.8.DC.4	Explain how information shared digitally is public and can be searched, copied, and potentially seen by public audiences.
TECH.9.4.8.DC.5	Manage digital identity and practice positive online behavior to avoid inappropriate forms of self-disclosure.
TECH.9.4.8.DC.8	Explain how communities use data and technology to develop measures to respond to effects of climate change (e.g., smart cities).
TECH.9.4.8.TL.1	Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.
TECH.9.4.8.TL.2	Gather data and digitally represent information to communicate a real-world problem (e.g., MS-ESS3-4, 6.1.8.EconET.1, 6.1.8.CivicsPR.4).
TECH.9.4.8.TL.3	Select appropriate tools to organize and present information digitally.
TECH.9.4.8.TL.5	Compare the process and effectiveness of synchronous collaboration and asynchronous collaboration.
TECH.9.4.8.TL.6	Collaborate to develop and publish work that provides perspectives on a real-world problem.
TECH.9.4.8.GCA.1	Model how to navigate cultural differences with sensitivity and respect (e.g., 1.5.8.C1a).
TECH.9.4.8.GCA.2	Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.
TECH.9.4.8.IML.2	Identify specific examples of distortion, exaggeration, or misrepresentation of information.
TECH.9.4.8.IML.3	Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b).
TECH.9.4.8.IML.4	Ask insightful questions to organize different types of data and create meaningful visualizations.
TECH.9.4.8.IML.5	Analyze and interpret local or public data sets to summarize and effectively communicate the data.
TECH.9.4.8.IML.7	Use information from a variety of sources, contexts, disciplines, and cultures for a specific purpose (e.g., 1.2.8.C2a, 1.4.8.CR2a, 2.1.8.CHSS/IV.8.AI.1, W.5.8, 6.1.8.GeoSV.3.a, 6.1.8.CivicsDP.4.b, 7.1.NH. IPRET.8).
TECH.9.4.8.IML.12	Use relevant tools to produce, publish, and deliver information supported with evidence for an authentic audience.

Technology and Design Thinking

CS.3-5.8.1.5.CS.3	Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.
CS.3-5.8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.
CS.3-5.8.1.5.DA.3	Organize and present collected data visually to communicate insights gained from different views of the data.
CS.3-5.8.1.5.DA.4	Organize and present climate change data visually to highlight relationships or support a claim.
	Data can be organized, displayed, and presented to highlight relationships.

Interdisciplinary Connections

LA.RI.5.1	Quote accurately from a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
LA.RI.5.2	Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.
LA.RI.5.3	Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.
LA.RI.5.4	Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.
LA.RI.5.5	Compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts.
LA.RI.5.6	Analyze multiple accounts of the same event or topic, noting important similarities and differences in the point of view they represent.
LA.RI.5.7	Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
LA.RI.5.8	Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s).
LA.RI.5.9	Integrate and reflect on (e.g., practical knowledge, historical/cultural context, and background knowledge) information from several texts on the same topic in order to write or speak about the subject knowledgeably.
LA.RI.5.10	By the end of year, read and comprehend literary nonfiction at grade level text-complexity or above, with scaffolding as needed.
LA.W.5.4	Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)
LA.SL.5.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
LA.L.5.1	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
LA.L.5.2	Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Differentiation

- Understand that gifted students, just like all students, come to school to learn and be challenged.
- Pre-assess your students. Find out their areas of strength as well as those areas you may need to address before students move on.
- Consider grouping gifted students together for at least part of the school day.
- Plan for differentiation. Consider pre-assessments, extension activities, and compacting the curriculum.
- Use phrases like "You've shown you don't need more practice" or "You need more practice" instead of words like "qualify" or "eligible" when referring to extension work.
- Encourage high-ability students to take on challenges. Because they're often used to getting good grades, gifted students may be risk averse.

- **Definitions of Differentiation Components**:

    - Content – the specific information that is to be taught in the lesson/unit/course of instruction.
    - Process – how the student will acquire the content information.
    - Product – how the student will demonstrate understanding of the content.
    - Learning Environment – the environment where learning is taking place including physical location and/or student grouping

Differentiation occurring in this unit:

Use Differentiation guide in Teacher's manual for each unit

Modifications and Accommodations

Refer to QSAC EXCEL SMALL SPED ACCOMMOCATIONS spreadsheet in this discipline.

Modifications and Accommodations used in this unit:

Benchmark Assessments

Benchmark Assessments are given periodically (e.g., at the end of every quarter or as frequently as once per month) throughout a school year to establish baseline achievement data and measure progress toward a standard or set of academic standards and goals.

Schoolwide Benchmark assessments:

Aimsweb benchmarks 3X a year

Linkit Benchmarks 3X a year

DRA

Additional Benchmarks used in this unit:

End of Unit assessments

Formative Assessments

Assessment allows both instructor and student to monitor progress towards achieving learning objectives, and can be approached in a variety of ways. **Formative assessment** refers to tools that identify misconceptions, struggles, and learning gaps along the way and assess how to close those gaps. It includes effective tools for helping to shape learning, and can even bolster students' abilities to take ownership of their learning when they understand that the goal is to improve learning, not apply final marks (Trumbull and Lash, 2013). It can include students assessing themselves, peers, or even the instructor, through writing, quizzes, conversation, and more. In short, formative assessment occurs throughout a class or course, and seeks to improve student achievement of learning objectives through approaches that can support specific student needs (Theal and Franklin, 2010, p. 151).

Formative Assessments used in this unit:

Teacher Observations

Checklists

Questions and Discussions

Quizzes

Summative Assessments

Summative assessments evaluate student learning, knowledge, proficiency, or success at the conclusion of an instructional period, like a unit, course, or program. Summative assessments are almost always formally graded and often heavily weighted (though they do not need to be). Summative assessment can be used to great effect in conjunction and alignment with formative assessment, and instructors can consider a variety of ways to combine these approaches.

Summative assessments for this unit:

End of Unit Assessments

Instructional Materials

See Above

Standards

MATH.5.M.B	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition
MATH.5.M.B.2	Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
MATH.5.M.B.3	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.
MATH.5.M.B.4	Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.