

Dear Parents,

We will begin our next unit of study in math soon. The information below will serve as an overview of the unit as you work to support your child at home. If you have any questions, please feel free to contact me. I appreciate your on-going support.

Sincerely,

Your Child's Teacher

## Unit Name: Volume

### Common Core State Standards:

**5.MD.3** Recognize volume as an attribute of solid figures and understand concepts of volume measurement. 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. 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.4** Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

**5.MD.5** Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. 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. 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. 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.

### Essential Vocabulary:

- rectangular prism
- dimension
- volume
- net
- length
- width
- height
- cubic units

### Unit Overview:

This is the first time that students begin exploring the concept of volume. In third grade, students begin working with area and covering spaces. Students are covering an area (the bottom of a prism) with a layer of unit cubes and then adding layers of unit cubes on top of the bottom layer. Students should have experiences with concrete manipulatives before moving to pictorial representations. As students develop their understanding of volume they will realize that a 1-unit by 1-unit by 1-unit cube is the standard unit for measuring volume. Students are required to determine the volumes of several right rectangular prisms, using cubic centimeters, cubic inches, and cubic feet. They are expected to understand that multiplying the length times the width of a right rectangular prism can be viewed as determining how many cubes would be in each layer if the prism were packed with or built up from unit cubes. Then, students can learn the formulas  $V = l \times w \times h$  and  $V = B \times h$  for right rectangular prisms. Students also recognize that volume is additive and they find the total volume of solid figures composed of two right rectangular prisms. Students should be given concrete experiences of breaking apart (decomposing) 3-dimensional figures into right rectangular prisms in order to find the volume of the entire 3-dimensional figure.

### Wake County Public Schools, Unit Overview for Parents

*This document should not replace on-going communication between teachers & parents.*

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**Strategies/Skills:**

Students will build rectangular prisms using cubes and find the volume in various ways: counting the cubes, multiplying the length  $\times$  width  $\times$  height, or multiplying the base (number of cubes on the first layer [length  $\times$  width]) by the height. Students will be shown nets and asked to find the volume of the rectangular prism once folded into a 3-dimensional figure.

- Cubes
- Pictorial representations of rectangular prisms
- Pictorial representations of complex figures (2 rectangular prisms that touch to form 1 shape)
- Nets

**Video Support:**

No videos are referenced for this unit.

**Additional Resources:**

If you have limited/no internet access, please contact your child's teacher for hard copies of the resources listed in this document.

- NCDPI Unpacking Document: [5<sup>th</sup> Grade Unpacking Document](#)