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<th>Grade-Level Standard</th>
<th>DLM Essential Element</th>
<th>Linkage Levels</th>
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| **M.5.MD.4** Measure volumes by counting unit cubes, using cubic cm, cubic in., cubic ft., and improvised units; **M.5.MD.5** Relate volume to the operations of multiplication and addition, and solve real-world and mathematical problems involving volume | **M.EE.5.MD.4-5** Determine the volume of a rectangular prism by counting units of measure (unit cubes) | **Initial Precursor**  
- Recognize separateness  
- Recognize enclosure  
**Distal Precursor**  
- Explain volume  
- Explain a unit cube  
**Proximal Precursor**  
- Explain volume as a composition of cube units  
- Calculate volume by counting unit cubes  
**Target**  
- Calculate volume of a right rectangular prism by packing unit cubes  
**Successor**  
- Solve word problems involving volume of rectangular prisms |

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<table>
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<th>How is the Initial Precursor related to the Target?</th>
<th>How is the Distal Precursor related to the Target?</th>
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<td><strong>Initial Precursor:</strong> Calculating volume using unit cubes requires students to be able to recognize that the items are separate from one another and can be grouped together. Work on this skill using a variety of sets. Help students recognize when items are grouped together into a set or separated out. Create these sets so that they are physically grouped together (e.g., enclosure, two or more boxes, two or more paper circles, two or more strings that can enclose the set). As educators present a set, they label it (e.g., two balls, one marker, three CDs), count the items, label it again, and encourage students to use numerals to label and count the separate sets. Use tools like the ten-frame to point out whole and parts (e.g., a row of 5 dots and a row of 4 dots are parts or subsets of 9).</td>
<td><strong>Distal Precursor:</strong> Once students begin to understand that items can be grouped together and counted (even if their counting is not yet accurate), educators can begin supporting students in understanding that many attributes can be measured even when using the same object (e.g., length, width, volume). For students working at the Distal Precursor linkage level, educators provide many experiences filling containers with different materials and helping students notice which materials fill all of the container and which leave gaps. When students start noticing the difference, educators can begin introducing &quot;fair&quot; comparisons (e.g., &quot;When it's hard to tell which will hold more, we can use a tool [unit cube] to help us.&quot;). Students need multiple experiences measuring different attributes (e.g., Which container is taller? Wider? Which one holds the most?) and comparing the unit of measure (e.g., unit cube, inches, number of paperclips). As students fill rectangular containers with unit cubes, educators teach the rule of no gaps or overlaps and support students in learning to count accurately.</td>
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A diagram showing the relationship of nodes in the mini-map appears below.

**Key to map codes in upper right corner of node boxes:**

- IP: Initial Precursor
- SP: Supporting
- DP: Distal Precursor
- S: Successor
- PP: Proximal Precursor
- UN: Untested
- T: Target
M.EE.5.MD.4-5 Determine the volume of a rectangular prism by counting units of measure (unit cubes)