

Mini-Map for M.EE.5.MD.4-5

Subject: Mathematics

Measurement and Data (MD)

Grade: 5

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.5.MD.4-5 Determine the volume of a rectangular prism by counting units of measure (unit cubes).	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.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Communicate understanding of "separateness" by recognizing objects that are not joined together. Recognize enclosure as an enclosed space that lies within a boundary that distinguishes it from the space that lies outside the boundary.	Communicate understanding that volume is the space enclosed by a three-dimensional shape or an object. Communicate understanding that a unit cube is a cube with edge lengths of 1 unit and a volume of 1 cubic unit.	Communicate understanding that the volume of a solid figure can be determined by filling the figure with unit cubes and that the volume can be calculated by counting the number of unit cubes.	Calculate the volume of a rectangular prism by packing a box with unit cubes and counting them.	Solve word problems involving the volume of a rectangular prism by determining the volume of the prism. (The volume of a rectangular prism should be determined by packing the prism with unit cubes.)

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

How is the Initial Precursor related to the Target?

Calculating volume using unit cubes requires a student 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).

How is the Distal Precursor related to the Target?

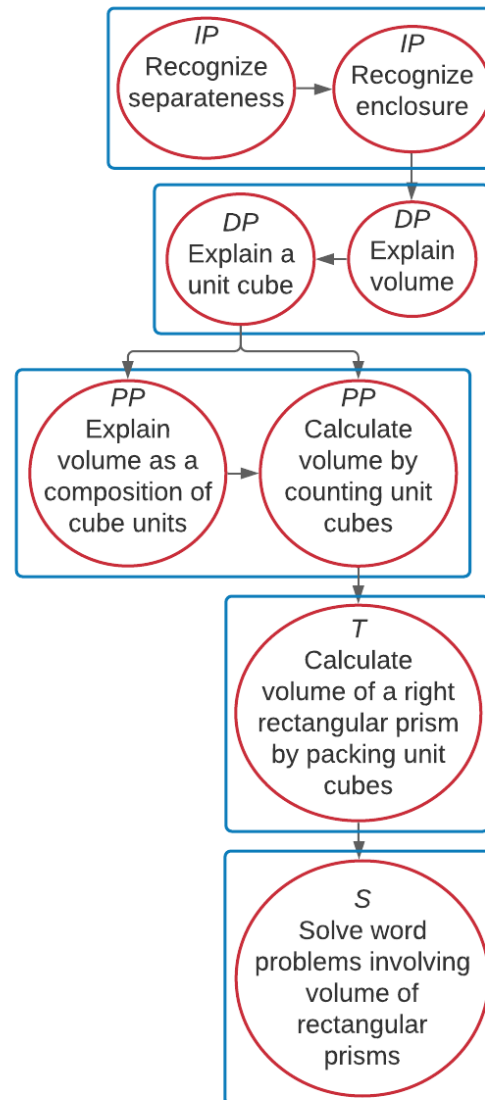
Once students begin to understand that items can be grouped together and counted (even if their counting is not yet accurate), educators can begin supporting students in understanding that many attributes can be measured even when using the same object (e.g., length, width, volume). For these students working at the Distal Precursor linkage level, educators provide many experiences with 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 "fair" comparisons (e.g., when it's hard to tell which will hold more we can use a tool [unit cube] to help us). Students need multiple experiences measuring different attributes (e.g., Which container is taller? Wider? Which 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.

Instructional Resources

Released Testlets
See the Guide to Practice Activities and Released Testlets .
Using Untested (UN) Nodes
See the document Using Mini-Maps to Plan Instruction .

[Link to Text-Only Map](#)

M.EE.5.MD.4-5 Determine the volume of a rectangular prism by counting units of measure (unit cubes).



Map Key	
IP	Initial Precursor
DP	Distal Precursor
PP	Proximal Precursor
T	Target
S	Successor
UN	Untested
Boxes indicate tested nodes	