

# QSM SAMPLE PROPOSAL – Grade 5 MATH

The following sample proposal should be used to gain a better understanding of the grant application questions and components. Copying or including any part of this sample in your proposal will be considered plagiarism and your proposal will be disqualified.

## I. Project Overview (9 points)

**What is the approximate number of students that will be directly impacted by your project?**

108

**Which grade band levels will your project impact?**

PK-3     4-8     9-12

**Which subject does your project fall under?**

Mathematics     Science     STEM

**What class(es) will your project impact?**

4 sections of 5th grade math

### Standards Sources

Identify source of the standards. Louisiana Student Standards should be given priority over national standards. National standards can be used if Louisiana State Standards are not available (e.g., upper level subjects). If other is selected, identify the source of the standards.

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Louisiana Student Standards for Mathematics         | <input type="checkbox"/> Louisiana Student Standards for Science           |
| <input type="checkbox"/> Louisiana's Birth to Five Early Learning Development Standards | <input type="checkbox"/> Computer Science Teaching Association Standards   |
| <input type="checkbox"/> Standards for Technological and Engineering Literacy           | <input type="checkbox"/> International Society for Technology in Education |
| <input type="checkbox"/> Advanced Placement   | <input type="checkbox"/> Common Core Standards for Mathematics             |
| <input type="checkbox"/> Other  |  |

### Standards Outline

Provide the following information for each standard.

- Provide a standard (by code and text) addressed by this project.
- List students' actions associated with the standard.
- List evaluation methods associated with the standard.

#### Standard 1

- 1a. *La. Math State Standard: 5.MD.C.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 that can be packed without gaps or overlaps using  $n$  unit cubes is said to have a volume of  $n$  cubic units.*
- 1b. *Students will use appropriate volume vocabulary when calculating and discussing their measurements of volume after having multiple experiences packing unit cubes into various solid figures.*
- 1c. *Teacher will observe and monitor student conversations while they engage in hands-on materials, taking anecdotal notes for correct vocabulary use. Completed work at stations will be checked for accuracy. A volume quiz and End-of-Unit test will be administered.*

#### Standard 2

- 2a. *La. Math State Standard: 5.MD.C.4 Measure volume by counting unit cubes, using cubic cm, cubic in., cubic ft., and improvised units.*
- 2b. *Students will fill rectangular prism-shaped containers using a variety of materials and then count them to measure volume. (sugar cubes, cm blocks, in blocks, etc.)*
- 2c. *Students will complete a recording sheet that includes a sketch of their work and their recorded measurements of each object. Teacher will collect and formatively assess.*

#### Standard 3 (optional)

- 3a. *La. Math State Standard: 5.MD.C.5a-c. Relate volume to the operations of multiplication and addition and solve real-world and mathematical problems involving volume.*
- 3b. *After students complete the activity described in 2b above, students will apply the formulas  $V=l \times w \times h$  and  $V=B \times h$  and compare the answer to their count. Additionally, students will solve real world volume problems with hands on materials and written calculations.*
- 3c. *A volume quiz and End-of-Unit test will be administered that includes word problems that deal with volume calculations.*

### Project Summary

Provide a brief summary of the project that addresses the items being requested and how this project will increase students' content knowledge, skills, and/or practices of the listed standards. (50-120 words)

*Students will engage in a weeklong exploration of volume. The teacher will utilize class discussions, hands-on activities and various engaging YouTube videos for students to develop a deep understanding of the meaning of volume and how it is calculated. Students will complete multiple center activities over the course of three days where they will build rectangular prisms with the purchased items (cube manipulatives), fill a variety of shapes with blocks, use virtual manipulatives, and solve real-world problems dealing with volume.*

## II. Rationale (6 points)

**State the primary motivating factor in proposing this project for the students (e.g., students' weakness, new curriculum, innovative project, challenges as a result of demographics, etc.). Include evidence supporting the motivating factor (e.g., student data, past experience, observation, education literature citations, etc.). (150-250 words)**

*The main focus of the 5th grade State measurement standards is volume. This is the first-time students are introduced to the concept of measuring volume. Students' prior experiences with volume were limited to measuring liquid volume. They are introduced to area in third grade, and these fifth-grade standards are meant to build on that understanding. Often, the students' spatial reasoning is weak and since volume introduces a third dimension, the students need plenty of experience with concrete objects before moving to pictorial representations.*

*In the Louisiana State Standards document, the main focus of each grade level's standards is listed. For 5th grade, Volume is identified as one of the three main focus areas. Included in the LEAP Assessment Guide for 5th grade, Volume is listed as a sub-category for a Major Content reporting category. Specifically, the guide states, "Students understand the concept of volume and determine volume using various strategies." (2021, p. 3) The identified major content is worth 50% of the total LEAP math score, therefore student understanding of volume is crucial.*

## III. Project Description (23 points)

### Timeline

Provide a timeline of project implementation.

*Day 1: Administer pretest. Through class discussion, review the concept of area and make sure students understand how it is calculated. Brainstorm what students already know about volume and then have them engage in some initial exploratory activities with boxes and centimeter cubes.*

*Day 2-4: Students will engage in 6 different hands-on activities, 2 per day, rotating in groups of 4-5 students each.*

*Day 5: Class sharing, and discussion of concepts learned over the past few days. Learn Number Rock song reinforcing volume concepts. (Youtube video)*

*Day 6-7: Solving word problems of real word situations that require calculating volume.*

*Day 8: Administer post-test.*

*Day 9+: Provide additional opportunities for students who don't display mastery to manipulate resources and practice skills.*

### Description

Describe the project's instructional plan and classroom activities that will be used to improve content knowledge, skills and/or practices of your students. The items requested in your budget should be included here. (350-600 words)

*Day 1: Administer pretest. Whole group: We will begin by brainstorming what students know already about volume and record this info on a KWL chart. The teacher will ask specific questions about dimensions of objects. Students will be given a small rectangular prism to aid their thinking. Next, they will be given centimeter cubes and asked to build their own rectangular prism and teacher will ask guiding questions once again to solicit using the dimensions of the prism to determine the number of cubes. Using all this information, the class will return to the KWL chart to refine our initial responses and add any questions we currently want to know. We will then create an anchor chart of key ideas.*

*Day 2-4: Each day, in small groups, the students will engage in 2 different structured activities with different manipulatives for 30 minutes. At the end of each day, in a whole class setting, students will share their experiences and the teacher will engage students in conversations that promote use of correct mathematical vocabulary and developing concepts.*

*Explore Volume with Non-Standard vs Standard Units (boxes, pattern blocks, marbles, erasers, centimeter cubes and Unifix cubes). Students will fill various sized boxes with a variety of non-standard unit items, count and record. Then, they will fill the same boxes with standard unit items and compare/notice that there were gaps and overlaps with non-standard units. (This will contribute to the discussion of cubic units.)*

*Sugar Cube Conundrum (rulers, boxes of sugar cubes) Students will look at the way the sugar cubes are packed in the box and count the total cubes. Then they will measure the box using the ruler to get a standard measure and compare the two. (This will contribute to the discussion about different units for finding volume.)*

*Can You Cube It? (one-inch cubes, square boxes, ruler) Students will fill an empty box with the cubes, dump it out and then recreate the same shape again. They will then measure the dimensions of the box to verify their answer. (This activity should cement the concept of volume for the students.)*

*Cool Cube Capers (different size Rubik's Cubes) Students will complete a chart recording the dimensions of different sized Rubik Cubes and calculate the volume. They will be challenged to figure out the volume if 2 or more cubes are stacked together. Finally, they will discuss why even though some of the cubes have the same measurable (using a ruler) dimensions, the volume varied. (This activity should help the realize the size of the square unit measurement matters.)*

*Base Ten Block Challenge (base ten blocks, 5 different storage boxes) Students are posed a real-life problem and students are asked to solve. "Your teacher has received a generous donation of multiple sets of base ten blocks but she is having a hard time figuring out how to store the blocks. She has a few different boxes but needs your help to determine which box should hold which set of blocks." (This activity has them thinking of volume a little differently.)*

*Under the Sea (Unifix cubes) Students are posed a real-life problem and students are asked to solve. “You are in charge of designing scaled, miniature models of aquariums to show the variety of sizes and shapes you offer. Using the information in the table given (scaled dimensions given for different sized aquariums), use Unifix cubes to model each tank and fill in the rest of the table (scaled volumes).” (This activity challenges students to find different shapes with the same volume.)*

*Day 5: As a whole group, we will discuss all the activities we participated in the past few days and synthesize our learning. We will revisit our anchor chart from day 1. Then we will watch a Youtube video: <https://www.youtube.com/watch?v=LZxXUb9iAZc> and learn a song that addresses all the key points about measuring volume.*

*Day 6: Task cards will be hung all around the classroom for students to move around with a clipboard and solve a variety of volume tasks. The tasks will be written at a variety of levels; some strictly vocabulary identification, some calculating volume, others solving real-world word problems.*

*Day 7: With partners, students will engage in Volume Error Analysis. Each pair of students will receive several worked problems and will be asked to rework the problem, identify the error as computational or conceptual and then explain the error using mathematical academic vocabulary.*

*Day 8: Administer Post-test.*

*Post Unit Activities: Based on post-test results, students will be grouped by need and lessons will be created to reteach missed concepts.*

## IV. Evaluation (9 points)

**List and describe the evaluation method(s) that will be used to determine student growth during the implementation of your project. (150-300 words)**

*For baseline data, a pretest will be administered that includes the content of the stated standards for this project (5MD.C.3-5), as well as the prerequisite skills taught in previous grades (3.MD.C.5, 3.OA.B.5, and 4.MD.A.3). Results of this test will be used to determine any remediation that needs to occur before/during this project in order for the students to be successful. Teacher will also utilize the comments made during the brainstorming session on Day 1 for baseline data and instructional decisions.*

*During project implementation, the teacher will observe and monitor student conversations while they engage with hands-on materials, taking anecdotal notes for correct vocabulary use. Completed work at stations will be collected and checked formatively (which will guide the teacher's questions and comments on the following days of instruction.*

*At the end of the proposed project, a volume quiz (posttest) covering all the volume standards (5MD.C.3-5) will be administered as a summative assessment. Following the assessment, reteaching will occur as needed and then at the end of the semester a cumulative Unit assessment will be administered that covers all standards taught this semester, including the volume standards.*

**Identify the target outcome(s) for student success. Indicate and describe the criteria for determining success at achieving the target outcome(s). (50-150 words)**

*The target outcome is for 90% of my students to score 85% or higher on the post-test. A comparison of pretest and posttest results will be conducted to determine if new understandings and knowledge resulted because of the project. Additionally, the teacher will analyze the comments students added to the anchor chart on day 5 to determine if advanced understandings surfaced.*

## V. Budget (8 points)

Budget items includes equipment and materials that will be used for quality instruction to increase knowledge, skills, or practices in Math, Science, and STEM classes. The maximum award is \$1,000 for PK-3 proposals and \$1,500 for 4-12 proposals.

The budget should include all QSM eligible items and QSM ineligible items that need to be purchased to successfully implement your project. If your budget includes QSM ineligible items and/or the total of QSM eligible items exceeds the award limitations, an explanation of how these items will be funded is required.

Click “+ New Item” to add a new budget item. For each item, specify if it is QSM eligible or QSM ineligible and fill in the Item Name/Description, Quantity, and Cost/Item. For QSM eligible items, the Vendor Name and Vendor Link is required.

QSM Eligible/Ineligible	Item Name/Description	Quantity	Cost/Item	Vendor Name	Vendor Link
Eligible	Centimeter cubes (set of 1000)	2	\$25.99	Hand2mind	<a href="#">Link</a>
Eligible	Fillable prisms	5	\$39.49	Amazon	<a href="#">Link</a>
Eligible	Cubed boxes (pack of 50)	1	\$14.99	Amazon	<a href="#">Link</a>
Eligible	Assorted size boxes (packs of 13)	4	\$14.99	Amazon	<a href="#">Link</a>
Eligible	Speed Cube Set (Rubik's Cubes; pack of 4)	6	\$22.99	Amazon	<a href="#">Link</a>
Eligible	Pattern blocks (class set)	1	\$101.99	Hand2mind	<a href="#">Link</a>
Eligible	Marbles (set of 100)	3	\$8.99	Amazon	<a href="#">Link</a>



Eligible	Unifix cubes (class set of 1000)	1	\$99.99	Hand2mind	<a href="#">Link</a>
Eligible	Sugar cubes (3 pack)	4	\$13.67	Amazon	<a href="#">Link</a>
Eligible	Rulers (set of 12)	3	\$11.99	Amazon	<a href="#">Link</a>
Eligible	1" cubes (set of 100)	5	\$13.99	Hand2mind	<a href="#">Link</a>
Eligible	Base ten blocks (class set)	1	\$127.99	Hand2mind	<a href="#">Link</a>

**QSM Eligible Items Total: \$979.86**

**QSM Ineligible Items Total: \$0**

**QSM BUDGET TOTAL: \$979.86**

Please indicate who will fund any overage for QSM Eligible items if needed. Select all that apply.

- School Funded
- District Funded
- PTA
- Private Company
- Non-profit organization
- Not Needed- QSM Eligible Items within Total Limitations
- Other

Please indicate who will fund any overage for QSM Ineligible items if needed. Select all that apply.

- School Funded
- District Funded
- PTA
- Private Company
- Non-profit organization
- Not Needed - Budget does not have QSM Ineligible Items
- Other