

MeTEOR Performance Task

Fourth Grade

Mathematics
Aquarium Lab

Performance Task Item: Aquarium Lab (Fish Room)

Grade Level: Fourth Grade

Focus Area: Surface Area and Volume

Essential Question: How does collecting all the necessary information impact the outcome of a situation?

Core Ideas:

- Understands volume.
- Understands how to use multiplication.
- Understands how to collect information for a proposal.
- Understands how to debate with others from a given perspective.

Learning Targets:

- Students will calculate square footage.
- Students will use estimation.
- Students will use reasonableness.
- Students will use multiplication to solve multi-step problems.
- Students will convert volume to gallons.
- Students will use research skills to collect information.
- Students will work with others cooperatively.
- Students will participate in a debate.

STANDARDS

Domain: Operations and Algebraic Thinking

Content Standards:

- Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
- Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.
- Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Domain: Measurement and Data

Content Standards:

- Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

- Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.*

Supporting Standards:

Speaking and Listening:

- Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.
- Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
- Follow agreed-upon rules for discussions and carry out assigned roles.
- Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
- Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
- Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.

Writing:

- Link opinion and reasons using words and phrases (e.g., *for instance, in order to, in addition*).

Math Practice Standards:

MP 2: Reason abstractly and quantitatively.

MP 3: Construct viable arguments and critique the reasoning of others.

MP 5: Use appropriate tools strategically.

MP 6: Attend to precision.

Materials:

- Performance Task
- Pencil
- Paper
- Calculator
- Computer

Scenario: The Science department is putting together a proposal for the local school board for an Aquarium Lab (fish room). The lab will have various water tanks of different shapes and sizes filled with amazing fish and sea life. Your task is to help build the proposal for the Aquarium Lab (fish room)!

Task/Question 1:

DOK Level 1: Recall & Reproduction

Math Practice Standards:

- MP 2: Reason abstractly and quantitatively.
- MP 6: Attend to precision.

A. The Science department has their eyes set on the empty room at the end of the 5th grade hall for the Aquarium Lab. The room is 30' by 50'. What is the square footage of the room?

B. Estimate how many fish tanks *you think* will fit on the shortest wall. Explain your thinking in writing.

Task/Question 2:**DOK Level 3:** Strategic Thinking and Reasoning**Math Practice Standards:**

- MP 2: Reason abstractly and quantitatively.
 - MP 5: Use appropriate tools strategically.
 - MP 6: Attend to precision.
- A.** Your teacher suggested the proposal for the Aquarium Lab needs to include three 10 gallon tanks, three 30 gallon tanks, and a 60-gallon tank. Your local pet store has 10 gallon tanks for \$79.99, 30 gallon tanks for \$159.00 and a 60-gallon tank for \$174.00. What will the total cost be to purchase these seven tanks? Show your work.
- B.** In researching tanks, you found an amazing sale on tanks that are 13 x 6 x 8. How many **gallons total** is this tank? Use the following website to get your answer:
<http://www.firsttankguide.net/calculator.php>
- C.** Would it be reasonable to have a 180-gallon tank? Explain your mathematical thinking in writing.
- D.** Each tank will hold about \$70 worth of fish. If all 7 tanks were full of fish, what would be the total cost for fish?

Task/Question 3:

DOK Level 3: Strategic Thinking and Reasoning

Math Practice Standards:

- MP 3: Construct viable arguments and critique the reasoning of others.

A. The Science Department needs to decide if the fish tanks should be fresh water, salt water or both. Research facts about each fish environment. Record 10 facts about each fish environment and cite the source in which you found the information.

B. With your science partner discuss the facts you collected on salt water tanks and fresh water tanks. Together develop a recommendation for the proposal.

Task/Question 4:

DOK Level 2: Skills and Application of Concepts

Math Practice Standards:

- MP 5: Use appropriate tools strategically.
 - MP 6: Attend to precision.
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- A.** Use the information you have collected (from Tasks/Questions 1-3) to create a proposal for the school board. Use the Aquarium Lab/Fish Room Proposal form provided.

Task/Question 5:

DOK Level 4: Extended Thinking

Math Practices Standards:

- MP 2: Reason abstractly and quantitatively.
- MP 3: Construct viable arguments and critique the reasoning of others.
- MP 5: Use appropriate tools strategically.
- MP 6: Attend to precision.

The Science Department has asked your class to participate in a debate. This debate will be a practice for the presentation to the school board. Be prepared to draw evidence from multiple sources to support your solution.

Complete Performance Task Scoring Rubric *Aquarium Lab (Fish Room)*

48-58 Proficient 37-47 Good 26-36 Satisfactory 15-25 Poor 0-14 Unsatisfactory

	Depth of Knowledge Level	Points	Total Possible Points for Task	Total Points Earned by Student
Task 1:			6	
A. 1500 square feet	1	3		
B. Estimate how many fish tanks will fit on the shortest wall. Explain your thinking in writing. – Student responses will vary.	1	3		
Task 2:			12	
A. \$890.97	1	3		
B. 13 x 6 x 8 tank is 2.7 gallons	1	3		
C. Answers will vary.	2	5		
D. \$490.00	1	1		
Task 3:			10	
A. Research facts will vary.	3	5		
B. Recommendation responses will vary.	3	5		
Task 4:			10	
Parts A and B: Completed Facts and Proposal Form will result in 10 student point.	2	10		
Task 5:			20	
Participation in Aquarium Lab debate.	4	20		

TOTAL POINTS:

Aquarium Lab / Fish Room Proposal

Room Request:

Budget:

Tank	Size	Cost	Cost of Fish
#1			
#2			
#3			
#4			
#5			
#6			
#7			
Total			

Facts on Fish Environments:



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