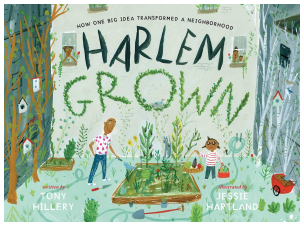
UVU School of EDUCATION
UTAH VALLEY UNIVERSITY

UVU CREATIVE LEARNING STUDIO
SCHOOL OF EDUCATION

Buying Soil



Task

Mr. Tony built raised beds for the plants. Suppose one bed was 8 ft long, 5 ft wide, and 1/2 ft deep. Soil can be purchased in cubic feet. How many cubic feet of soil does Mr. Tony need for 1 raised bed?

Standards and Learning Targets

Standard 6.G.2 Find the volume of a right rectangular prism with appropriate unit fraction edge lengths by packing it with cubes of the appropriate unit fraction edge lengths (for example, 3½ x 2 x 6), and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = lwh and V = bh to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. (Note: Model the packing using drawings and diagrams.)

Learning Target: Find the volume of a rectangular prism with fraction edge lengths

Lesson Outline

Anticipate Strategies and Misconceptions: Before you begin this lesson, be sure to anticipate strategies your students might use or the misconceptions your students might have about finding volume using the Picture Book Problem Monitoring Chart.

Launch: Read aloud Harlem Grown: How One Big Idea Transformed a Neighborhood by Tony Hillery. Ask students to think about what they notice or wonder that could be answered using math.

Gather student ideas. Then propose the following problem: Mr. Tony built raised beds for the plants. Suppose one bed was 8 ft long, 5 ft wide, and 1/2 ft deep. Soil can be

purchased in cubic feet. How many cubic feet of soil does Mr. Tony need for 1 raised bed? Use numbers and pictures to explain your thinking.

We're going to figure this out by making a model of our raised bed. Then we're going to fill our raised bed with centimeter cubes. Do you think the volume will be greater than, less than, or equal to 40? Why?

Buying Soil Recording Sheet

Explore: Provide students with a 8 x 5 x 1 net to pack with centimeter cubes. Then determine the volume of the raised garden bed if it were only ½ inch deep.

***While students already know the formula for volume from their work in 5th grade, packing cubes into a rectangular prism will help them develop their understanding of a fractional dimension and what that does to the volume of the rectangular prism.

As students work, use the monitoring chart to monitor the strategies students use or the misconceptions they are demonstrating about volume. Then purposefully select 3-4 students to share their solution strategies. Some strategies you might see:

- Fill the bed and count the cubes without realizing the raised bed is only ½ a cube deep
- fill the base of the bed and then counting half the cubes to determine the volume
- Find the area of the raised bed and then multiplied times ½
- Half one of the factors and then multiply by the other factor

Summarize: As students share, ask questions about their strategies and reasoning. Here are some ideas for discussion questions:

- How are the strategies alike and different?
- What happens to the volume when one of the dimensions is less than 1?
- Why is the volume to less than 40 if the product of 8 x 5 is 40?
- Can you think of other ways to find the volume of the raised garden bed?

Extension Ideas:

- Change the dimensions of the garden bed
- Figure out how much it would cost to buy the soil
- Find a space in the school yard and figure out the dimensions a garden could be . . . the possibilities here are endless!

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Thank you for using one of our Picture Book Tasks! We would love to know more about your students' strategies when solving the problem, ideas you had for improving the task, and other math problems you and your students noticed or wondered about after reading the book.

Please complete our Picture Book Task Survey so that we can learn more about your experience teaching, how students solve problems, and improve our Picture Book Task Bank.