Calculating Area and Volume in Raised Beds

5th Grade Garden Math Lesson

Objective: Students will measure an existing garden bed and calculate the area and volume to determine how much soil and compost is needed to fill a new one.

Materials:

Garden map
Clipboards, pencil, and worksheet
Yard stick or meter stick
Measuring tape
Calculator

Background:

Healthy soil is the single most important ingredient for a successful garden. Raised beds have an immediate advantage over a regular garden because you can fill them with a blend of topsoil and compost that is better than the native soil in the yard. Soil that's loose and rich with nutrients and organic matter will allow the roots of your plants to grow freely, and ensure that they have access to the water and nutrients they need to sustain healthy growth. A mixture of 70% topsoil and 30% compost will give the flowers and vegetables a healthy medium to grow in.

Procedure:

Students work in pairs and select one raised bed to measure in the garden. They will measure the area of the bed, then calculate the volume of soil in the bed. Lastly, they will calculate how many cubic cm/ m of topsoil and compost are needed to fill a new raised bed.

Bonus:

Calculate the volume of soil in the tires.
Calculate the volume of water the rain barrel can fill.

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Name _____ Date _____

Instructions:
Healthy soil is the single most important ingredient for a successful garden. Raised beds have an immediate advantage over a regular garden because you can fill them with a blend of topsoil and compost that is better than the native soil in the yard. Soil that's loose and rich with nutrients and organic matter will allow the roots of your plants to grow freely, and ensure that they have access to the water and nutrients they need to sustain healthy growth. A mixture of 70% topsoil and 30% compost will give the flowers and vegetables a healthy medium to grow in.

Choose one of the raised beds on the map (1-9). Calculate the area of the bed and the volume of the soil in the bed. Then calculate how much topsoil and compost are needed to fill the bed.

Raised bed # _____

1. Calculate the area of raised bed:
Write down the formula for area and find area in square centimeters and meters.
 (Write down the conversion from centimeters to meters.)

_____

_____

2. Calculate the volume of soil in the raised bed:
    Write down the formula for volume and find volume in cubic centimeters and meters.
    (Write down the conversion from centimeters to meters.)

_____

_____

3. Calculate how much topsoil and how much compost is needed to fill the bed. You will need a blend of 7/10 topsoil, 3/10 compost.

_____ cubic cm of topsoil   _____ cubic m of topsoil

_____ cubic cm of compost   _____ cubic m of compost

BONUS QUESTIONS:

4. Calculate the volume of the soil in the tires:

5. Calculate the volume of water needed to fill the rain barrel.

*Hint: Volume of a cylinder = pi times radius (squared) times height, or $V = \pi r^2 H$
(π = 3.1415)