5th Grade Garden Math:

Calculating Area and Volume in Raised Beds

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.

1. Raised bed # _____

2. Calculate the area: Area = Length times Width A = L x W

_____ square cm

_____ square m

* To convert square cm to square m you will need to divide by 100.

3. Calculate the volume of soil in the raised bed: Volume = Length times Width times Depth V = L x W x D

_____ cubic cm

_____ cubic m

* To convert cubic cm to cubic meters you will need to divide by 1,000.

4. Calculate how much topsoil and how much compost is needed to fill the bed. You will need a blend of 70% topsoil, 30% compost.

_____ cubic cm of topsoil _____ cubic m of topsoil

_____ cubic cm of compost _____ cubic m of compost

BONUS QUESTIONS:

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

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

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