

# Determination of MSW Specific Weight





# Problem Definition

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Determine the specific weight of the collected MSW with the composition given in Table 1.

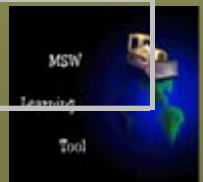
It is recommended that you use an electronic spreadsheet when you do this problem.





# Table 1. Composition of MSW

Waste Category	As Collected, % by weight
Food Waste	30
Paper	35
Yard Waste	15
Plastics	5
Aluminum	6
Other	9
Total	100





# Step1. Determine Specific Weight of Categories

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- In order to determine the overall specific weight, it is necessary to calculate the volume of individual categories
- Assumed values for this problem are given in Table 2.



# Table 2. Category Specific Weight

Waste Category	As Collected, % by weight	Specific Weight, lb/cuyd
Food Waste	30	490
Paper	35	150
Yard Waste	15	170
Plastics	5	110
Aluminum	6	270
Other	9	810
Total	100	



## Step 2. Determine Volume of Categories

- Assume you have 100 lb of waste. What would be the volume of 100 lbs of waste?
- To calculate the volume, determine the volume of the individual waste categories
- Then total the volume
- Example:

$$\begin{aligned}\text{Food Waste Vol., cu yd} &= 30\text{lb}/490 \text{ lb/cu yd} \\ &= 0.061 \text{ cu yd}\end{aligned}$$





# Table 3. Volumes of Categories

Waste Category	As Collected, % by weight	Specific Weight, lb/cu yd	Volume, cu yd
Food Waste	30	490	0.061
Paper	35	150	0.233
Yard Waste	15	170	0.088
Plastics	5	110	0.045
Aluminum	6	270	0.022
Other	9	810	0.011
Total	100		0.460



## Step 3. Determine Specific Weight

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Total volume of 100 lb of weight is 0.460 cu yd

$$\begin{aligned}\text{Specific weight} &= 100 \text{ lb}/0.460 \text{ cu yd} \\ &= 217 \text{ lb/cu yd}\end{aligned}$$





# Further Thoughts

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- Calculate the composition of the waste based on % volume.
- Which component has the greatest impact on the volume of the waste?
- How does the volume composition differ from the waste composition by weight?



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