

NR 200 SOILS LAB 5

Bulk Density

Soil Type or Name	Weight of cylinder + soil in	Weight of empty cylinder	Weight of soil	÷	Volume of soil in cc. (ml)	=	Bulk density in gms./cc
Example	<u>158</u>	<u>36</u>	<u>122</u>		<u>100</u>		<u>1.22</u>
Your Soil	_____	_____	_____		_____		_____
2 nd . Soil	_____	_____	_____		_____		_____
	A	-	B	=	C		

Note 1 cc = 1 ml

$$\text{Bulk Density (3)} = \frac{(1) \text{ Weight of soil in grams}}{(2) \text{ Volume of soil in cc.}}$$

Porosity

Soil Type or Name	Volume of water added to pore space in cc	Volume of soil in cc.	Percent pore Space I	Percent Pore Space II calculation: % $100 - \frac{(\text{Bulk Density} \times 100)}{\text{Particle Density}}$
Example	<u>53</u>	<u>100</u>	<u>53</u>	_____
Your Soil	_____	_____	_____	_____
2 nd . Soil	_____	_____	_____	_____

$$\text{Per Percent Pore Space I} = \frac{\text{Volume of pore space (water used)}}{\text{Volume of Soil}} \times 100$$

$$\text{Percent Pore Space II} = \text{Bulk Density} \times 100 = \mathbf{Y}$$

$$\mathbf{Y} \div \text{Particle Density} = \mathbf{X}$$

$$100 - \mathbf{X} = \text{Percent Pore Space II}$$

*** In order to calculate % pore space II, it is first necessary to determine both bulk and particle densities and to apply these figures to the appropriate equation.**

Particle Density

Water level prior to washing down the sides = _____ after washing = _____ Difference _____

Second Soil Sample = _____ Difference _____

Your soil
 Total water used = _____ Level after 5 minutes _____
 (50 + water used to rinse)

2nd. Soil
 Total water used = _____ Level after 5 minutes _____
 (50 + water used to rinse)

Soil Type or Name	1 Weight of soil in grams	÷ Volume of water and soil in cc.	Total volume of water used in cc.	2 = Portion of volume occupied by soil in cc.	3 Particle Density in gms./cc
Example	<u>50</u>	<u>36</u>	<u>60</u>	<u>19</u>	<u>2.63</u>
Your Soil	_____	_____	_____	_____	_____
2 nd . Soil	_____	_____	_____	_____	_____
		A	- B =	C	

$$\text{Particle Density} = \frac{\text{Weight of soil used}}{\text{cc occupied by soil particles}}$$

Type your answers in bold face font

From your results:

1. How does bulk density vary with the amount of clay in your soil?

2. How does the percent total pore space vary with the percentage of clay in the soil?

3. Do the bulk densities that you found correspond to what you would expect from the textures of the soils? If not what could be the cause of the discrepancies?

4. Do the values you found for the percent pore space correspond to what you would expect from those textures? If not what could have caused those discrepancies?

5. Would you expect the soil with the greatest amount of pore space to have the most rapid air and water movement? Explain (consider the size of the pore space)

6. Discuss how total pore space and individual pore size distribution characteristics are affected by the soil texture.

7. Explain the difference between permeability and pore space and what influences each?

8. Using the information from the entire class did we find some consistencies with the numbers ie in terms of texture.....please explain your findings.

