

1. A soil from a semiarid environment has white colors in the subsoil. These white colors are most likely due to the presence of CaCO₃ (calcium carbonate)

2. Match the following descriptions with the most appropriate term from the list on the right:

- a. Collapsible soils
- b. Cohesive soils
- c. Non-cohesive soils
- d. Texture
- e. Structure
- f. Porosity
- g. Sand
- h. Land degradation
- i. Eutrophication
- j. Saltation
- k. Suspension
- l. COLE
- m. Proctor
- n. Compression
- o. Penetrometer
- p. Tilt

c Soils that have the least amount of strength when dry

k Process by which silt grains are transported during wind erosion.

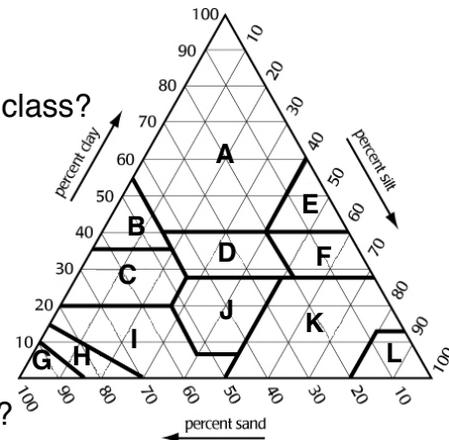
b Soils that have good strength unless they are wet

m Test designed to determine water content at which maximum bulk density can be achieved

l A measure of a soil's shrink/swell potential

i Process by which aquatic habitats are degraded though nutrient additions

3. Use the USDA textural triangle shown on the right to answer parts a-c below.



I a. Which letter represents the SANDY LOAM textural class?

D b. Which letter represents the LOAM textural class?

37 c. A soil contains 33% sand and 30% silt. What is the percent clay?

D What letter represents the textural class for this soil?

4. Consider the Universal Soil Loss Equation to predict erosion (Soil loss = RKLSCP):

P If a farmer decides to plow along the field contours rather than up and down the slopes, which factor will change?

decrease Will this factor increase or decrease?

R Which factor is related to climate?

5. Indicate whether each of the following is TRUE (+) or FALSE (-):

- In the US, more erosion occurs by wind rather than by water.
- + Structured clays typically have greater porosity than do loamy sands.
- Adding compost to a clayey garden soil will make it loamier.
- + Less compaction occurs when a dry rather than moist cohesive soil is trafficked.
- + Organic soils typically have bulk densities less than that of water.

6. A 200-cm³ core of a forest soil is collected. After oven-drying, the core weighs 300 g.

1.5 g/cm³ (3 pts) What is the bulk density? For full credit, show work and give units.

$$D_b = \frac{\text{oven-dry soil mass}}{\text{soil volume}} = \frac{300 \text{ g}}{200 \text{ cm}^3} = 1.5 \text{ g/cm}^3$$

The % pore space of this sample is approximately: 57 ; 53 ; 50 ; 47 ; **43** (Assume a particle density of 2.65) (circle choice)

$$\% \text{ pore space} = 100 - [D_b / \text{particle density}] \times 100 = 100 - 57 = 43$$

7. The A horizon of Soil A has granular structure; the A horizon of Soil B has platy structure. In which soil would you expect greatest movement of air and water? A

8. When a soil is compacted, describe a soil physical property that is altered and the manner in which it changes (2 pts):

bulk density is increased; porosity is decreased; soil strength increases

Images

9. 10YR 5/2 What is the correct Munsell notation for the color chip indicated by the red circle?

10. Profile A Which soil would be better suited as a building site for a house with a basement?

11. A This figure shows air temperature and soil temperatures at 10 cm depth for a straw-mulched and unmulched soil in Texas during August. Which curve (A or B) represents the soil temperature for the unmulched soil?

12. Dust Bowl What area discussed in class is indicated by the brown shading on this map?

Extra Credit

1 m³ of water weighs 2205 lbs. How many pounds does 1 m³ of soil weigh if it has a bulk density of 1.2 g/cm³? **2205 lbs x 1.2 = 2626 lbs (water has a density of 1.0, so a soil with a bulk density of 1.2 has 1.2 times as much mass per unit volume)**