

SOIL PROPERTIES

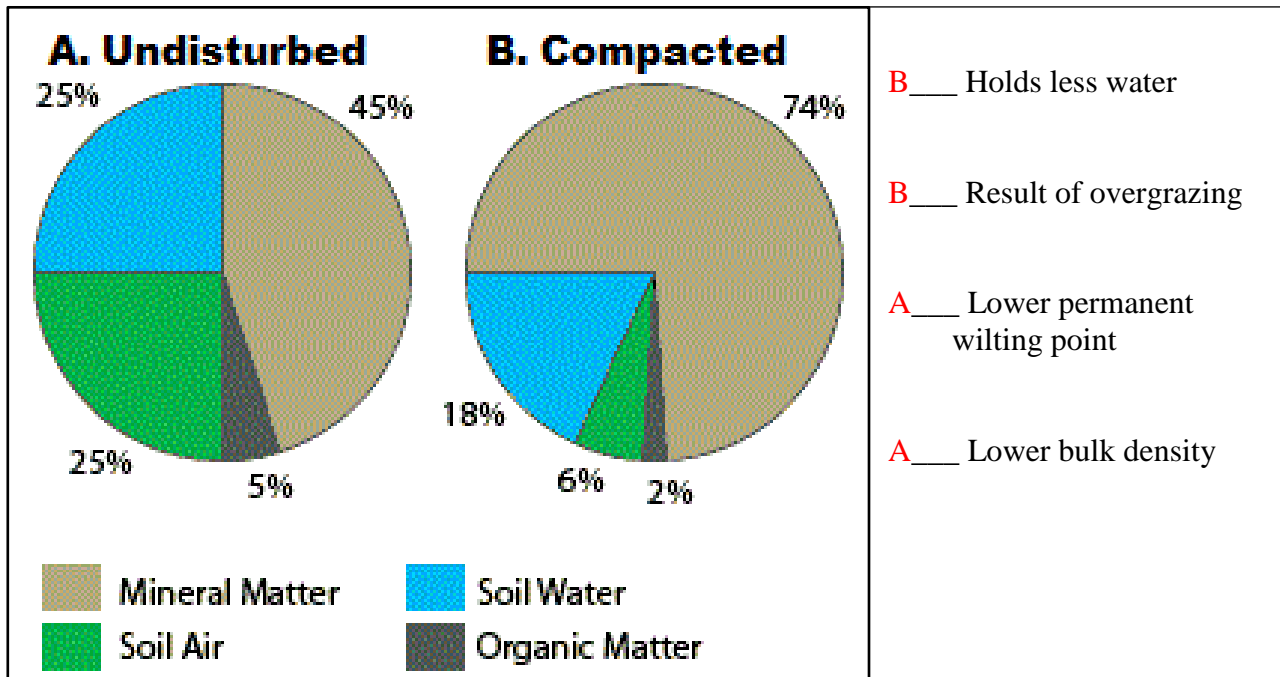
- 1) List two of the five main functions of soil. (2 points)
 Habitat for organisms, Engineering medium, Filters and stores water, Anchor for plants, Cycles nutrients

- 2) Small groups of soil particles that are bound together and contain pores are called: (1 point)
 - a) Structures
 - b) Aggregates
 - c) Profiles
 - d) Pedons

- 3) List two of the five soil formation factors. (2 points)
 Climate (weather), Organisms (biology), Relief (topography), Parent Material, Time

- 4) Parent material that is deposited by gravity is referred to as: (1 point)
 - a) Landslide
 - b) Mass flow
 - c) Colluvium
 - d) Loess

- 5) Use the charts below to match soil type A or B to the descriptions on the right. (4 points)



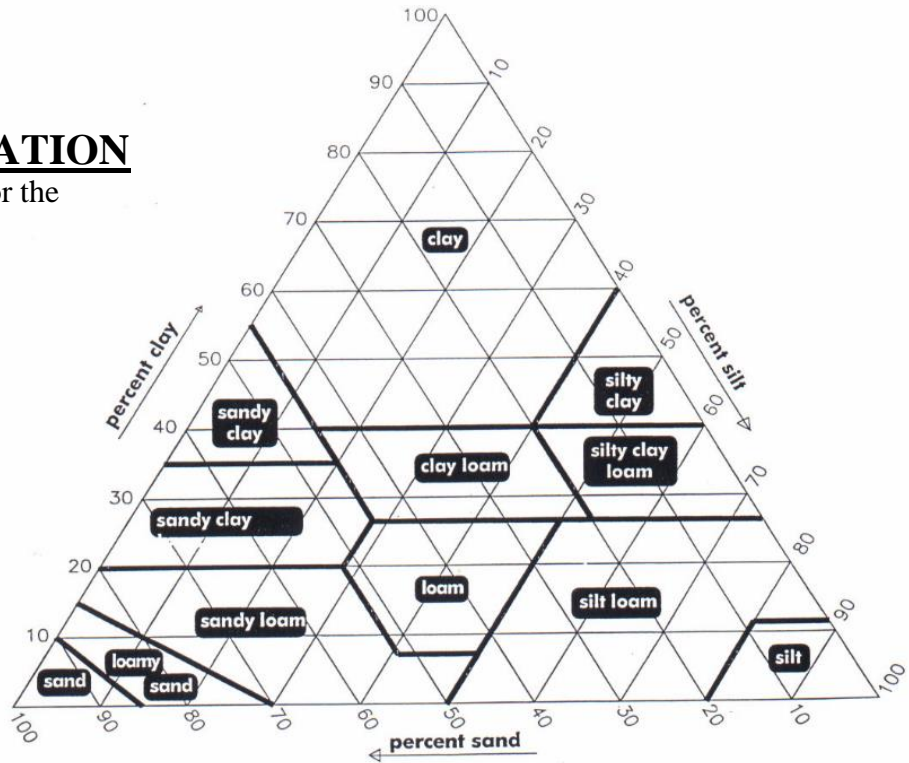
- 6) The movement of water through the soil profile is called: (1 point)
 - a. Leaching
 - b. Percolation**
 - c. Saturation
 - d. Translocation

- 7) What soil property(s) are important for deciding where to bury deceased cattle? (1 point)
 - a) Texture
 - b) Soil depth
 - c) Water table depth
 - d) B and C
 - e) All of the above**

- 8) Circle the term that describes a soil state so full of water there is nearly no air in the pores. (1 point)
 - a) Saturation**
 - b) Aerobic
 - c) Field capacity
 - d) Redoximorphic

SOIL CLASSIFICATION

Use the **texture triangle** for the following questions:



- 9) What is the maximum percentage of clay that can be found in sandy loam? (1 point)

20%

- 10) What texture describes a soil that has 49% sand and 35% silt? (1 point)

Loam

- 11) Determine the texture and color of Soil Samples A and B. Use **Exhibit A. Soil Texture By Feel Flow Chart** and **Munsell Color Book** provided. (8 points)

	Texture	Color Name or Munsell Notation (moist)
Sample A	<u>3 pts:</u> Silt Loam	<u>1 point:</u> Dark Reddish Brown or 5YR 3/4 <u>0.5 points:</u> Dark reddish gray, Reddish Brown or 5YR 3/2-3, 5YR 4/2-4
Sample B	<u>3 pts:</u> Gravelly Silty Clay Loam <u>1.5 pts:</u> Silty Clay Loam	<u>1 point:</u> Very dark greyish brown or 10YR 3/2 <u>0.5 points:</u> Very dark brown, dark brown, dark grayish brown or 10YR 3/3, 10YR 2/2, 10YR 4/2

- 12) Use the provided **Exhibit B. Profile Descriptions** to identify the Soil Series for each of the soil monolith samples. (4 points)

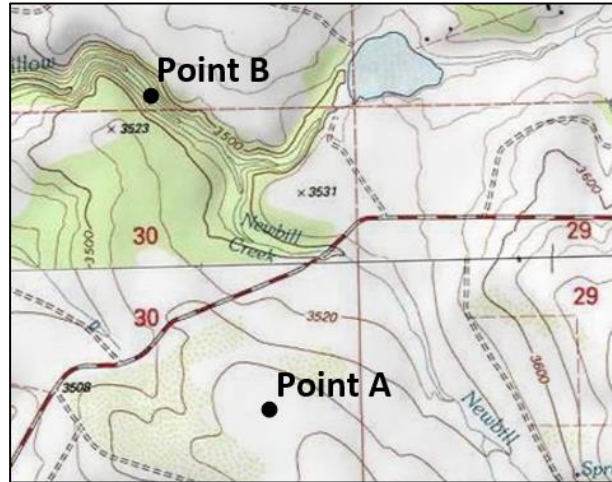
Soil Monolith	Soil Series Name
Sample A	Walla Walla Silt Loam (2 pts)
Sample B	Jory Silty Clay Loam (2 pts)

SOILS & LAND USE MANAGEMENT

- 13) In terms of soil fertility, what does the “P” in NPK stand for? (1 point)
Phosphorus
- 14) Which change would you expect to occur to soil in a crop field after reducing tillage? (1 point)
- Aggregate stability will weaken
 - Earthworm populations will decline
 - Erosion will be reduced**
 - Soil organic matter will be lost
- 15) Which of the following is not a physical force that directly causes soil erosion? (1 point)
- Rain
 - Wildfire**
 - Wind
 - Waves
- 16) Which soil texture is the best filter for urban runoff? (1 point)
- loamy sand
 - silty clay
 - loam**
 - sand

17) Based on the topographic map below, which point has steeper slope? (1 point)

- a) Point A
b) Point B



You are contracted to determine the bulk density of soil in a plot where a septic system will be installed for a new home. Using a core with a volume of 90.0 cubic centimeters you measure the following dried weights from three samples: 108.3 grams, 110.1 grams, 105.6 grams.

18) Calculate the average bulk density for the plot. **Round to the nearest tenths, label with units, and show your work.** (4 points)

1.2 (2pts) g/cm³ (1pt) showing work (1pt)

$$(108.3+110.1+105.6)/3/90=1.20$$

$$((108.3/90)+(110.1/90)+(105.6/90))/3=1.20$$

19) Match the letter of each rangeland management activity to the soil effect it is most likely to cause. (3 points)

Management Activity

- A. Implement prescribed grazing
B. Remove juniper trees
C. Using prescribed fire

Soil Effect

- C** ___ Adds soluble nutrients to soil
B ___ Increase water stored in root zone
A ___ Reduces compaction

20) What is the name of the soil tool provided? (1 point)

- a) Soil probe
b) Depth meter
c) Soil auger
d) Bulk density tester

Use the soil tests below to answer the following questions:

Field: Johnson SW								
Depth (ft)	Available Inches	NO ₃ lbs/acre	NH ₄ lbs/acre	Sulfur ppm	pH	Organic Matter %	P ppm	K ppm
1	0.73	42	16	3	5.3	2.45	28.0	311
2	1.98	11		2	6.3			
3	1.00	7		2	6.6			
Field: Johnson NE								
Depth (ft)	Available Inches	NO ₃ lbs/acre	NH ₄ lbs/acre	Sulfur ppm	pH	Organic Matter %	P ppm	K ppm
1	0.51	23	8	4	5.1	1.43	27.0	378
2	0.97	13		3	6.0			
3	1.08	9		3	6.5			

21) What is the pH of the second foot of soil in the field named “Johnson NE”? (1 point)

6.0

22) Based on these tests, which field would you expect to be more fertile for growing small grains? (1 point)

- a) Johnson SW
- b) Johnson NE

SOIL SURVEY

Use Exhibit C. Custom Soil Resource Report for Trout Creek- Shaniko Area, Oregon to answer the following questions:

23) At what scale was this soil survey mapped? (1 point) 1:31,700

24) In what year was this soil survey published? (1 point) 2015

25) What is the Map Unit Name of map symbol GrD? (1 point)

Gribble cobbly loam, 5 to 20 percent slopes

26) On what landform(s) does soil map symbol MtB occur? (1 point)

Alluvial fans and stream terraces

27) Of these two soil types, **GrD** and **MtB**, which is predicted to be better suited for livestock fence construction? Explain why. (4 points)

MtB (2 points) and one of the following (2 points):

GrD has higher rock-fragment/cobble content, has steeper slope, has more clay, has higher shrink-swell, or has a root-restrictive layer at 94 centimeters