Total Score _____/50

Team #:_____

SOIL PROPERTIES

1) Complete the list of the five soil formation known by their acronym ClORPT. (*2 points*)

Climate
O_____
Relief
P_____ _____
Time

2) Which soil structure type is most likely to allow water to move down through the soil profile quickly? (*1 point*)
   a) granular
   b) squiggly
   c) massive
   d) platy

3) A wind-transported soil parent material you might find near a volcano is called: (*1 point*)
   a) glacial deposits
   b) ash
   c) organic material
   d) residuum

4) Where can you expect the thinnest topsoil? (*1 point*)
   a) ridgetop
   b) stream terrace
   c) bottom of a hill
   d) no-till field

5) In soil formation, leaching of nutrients out of the soil profile by rainfall or irrigation is considered a/an: (*1 point*)
   a) addition
   b) loss
   c) translocation
   d) transformation

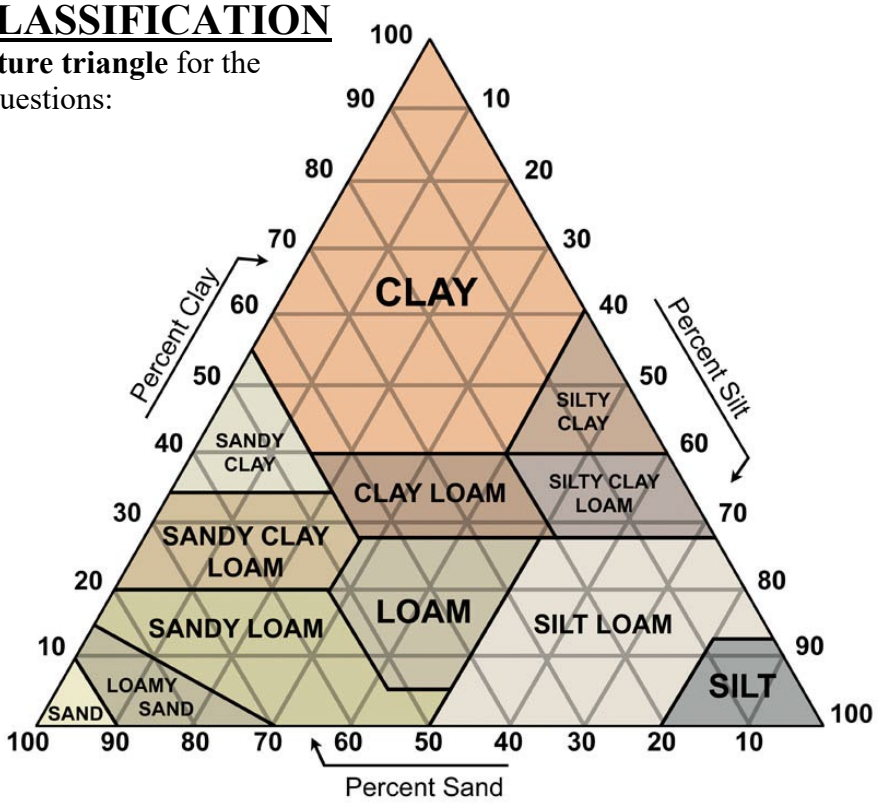
6) When a clay particle breaks down into a different mineral it is considered a/an…? (*1 point*)
   a) addition
   b) loss
   c) translocation
   d) transformation

_____**/7**

7) Which of the following affect soil pH Circle all that apply (*2 points*)
   a) blocky structure
   b) adding fertilizer or lime
   c) bright soil matrix colors
   d) excessive or limited rainfall

SOIL CLASSIFICATION

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



8) What is the minimum percentage of clay that can be found in clay? (*2 points*)

_____**%**

9) What texture describes a soil that has 40% sand and 30% silt? (*2 points*)

_____ _____

10) Determine the texture and color of Soil Samples A and B. Use **Soil Texture By Feel Flow Chart** and **Munsell Color Book** provided**.** (*6 points*)

Texture	Munsell Color Notation (moist)

_____**/12**

Use the provided **soil monolith to answer the following true or false questions**. (*1 point each*)

11) The bottom of the A horizon is at 45 centimeters.
    a) true
    b) false

12) There is no bedrock present within the soil profile.
    a) true
    b) false

13) This soil is well drained because it does not contain redoximorphic features.
    a) true
    b) false

14) This soil would drain quickly due to sandy textures and many rock fragments.
    a) true
    b) false

SOILS & LAND USE MANAGEMENT

15) Which drainage class of soils would make the best iris farm? *(1 point*)
    a) Excessively drained
    b) Moderately well drained
    c) Not so goodly drained
    d) Very poorly drained

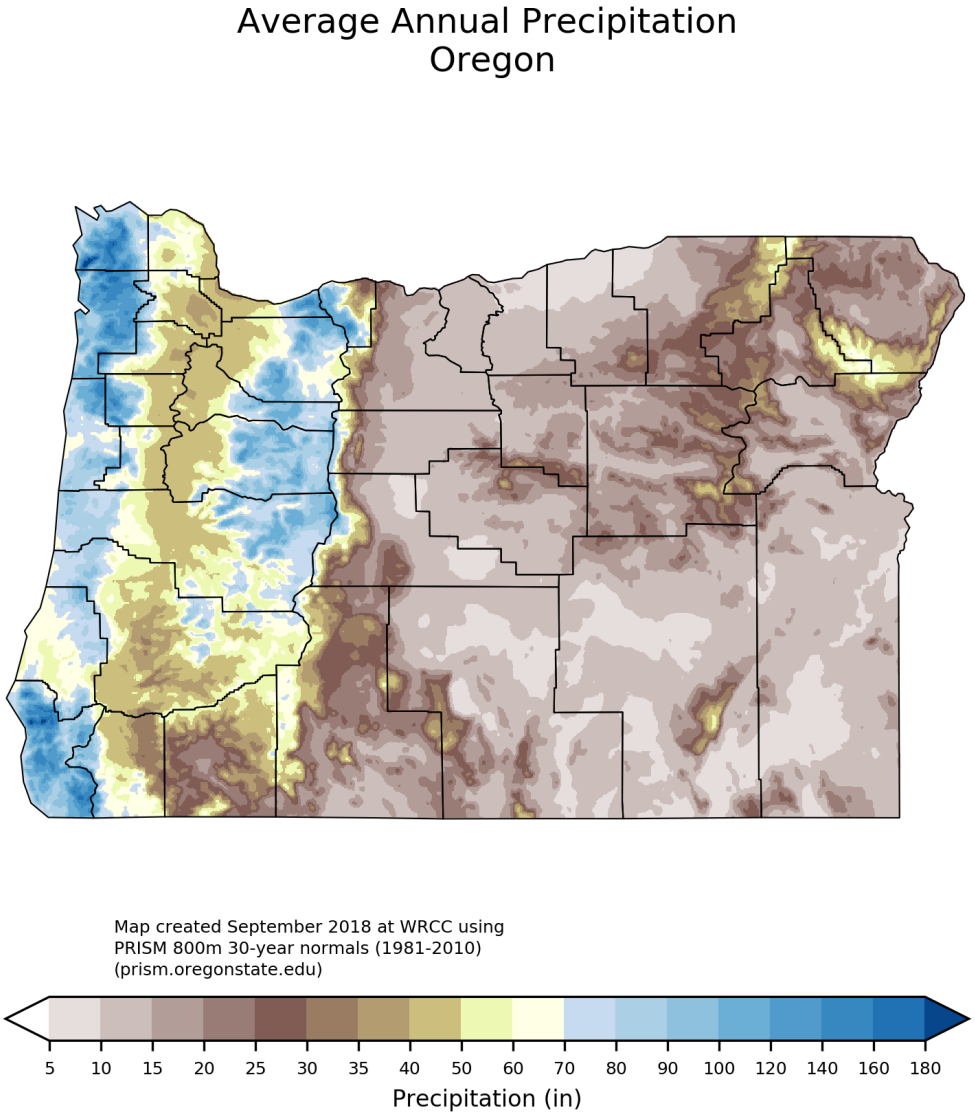
16) In which slope class might you find a low-lying wetland? *(1 point*)
    A- ≤ 3% slope
    B- 4 to 8% slope
    C- 9 to 15% slope
    D- 16 to 35% slope
    E- 36 to 60% slope
    F- 61 to 80% slope

17) Which of the following is considered a root limiting layer? Select all that qualify. (*2 points*)
    a) Granular soil structure
    b) Dense hardpan from years of plowing
    c) Silt loam
    d) Seasonal high water table

18) Which earth cycles are soils involved in? *(1 point*)
    a) Hydrologic cycle
    b) Carbon cycle
    c) Nitrogen cycle
    d) All of the above

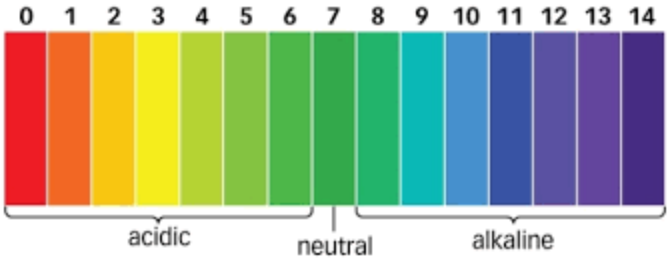
_____**/9**

19) What is the name of the soil tool provided? (*1 point*)
   a) densiometer
   b) buchner funnel
   c) soil sieve
   d) bulk density tester



20) Based on the rainfall map above, where would you expect the most mineral leaching out of the soil profile occur? (*1 point*)
   a) western Oregon
   b) eastern Oregon

_____**/2**



21) Based on the rainfall map and pH scale above, which landscape would you expect to have the highest (most alkaline/basic) pH? (*1 point*)
   a) western Oregon
   b) eastern Oregon

22) Why did you select your answer for questions 20 and 21? (*1 point*)

23) Which pH range do most agricultural plants tolerate best? (*1 point*)
   a) Strongly acid (5.1-5.5)
   b) Neutral (6.6-7.3)
   c) Moderately alkaline (7.9-8.4)

24) Discuss at least one way in which soils can be used to reduce or reuse waste. Explain how it works. (*3 points*)

_____**/6**

SOIL SURVEY

Use the **Soil Map for** a portion of **Opal Creek Wilderness Area** to answers the following questions:

25) At what scale was this soil survey **mapped**? (*1 point*)

1:_____

26) What is the **scale of the printed map**? (*1 point*)

1:_____

27) What is the Map Unit Name of map symbol **8305**? (*1 point*)

_____

28) What is the available water capacity in centimeters per centimeter for map unit symbol **8101**? (*1 point*)

_____

29) You are hired as a soil scientist for the United States Forest Service, the federal agency that manages Opal Creek Wilderness Area, an area that was burned during the tragic 2020 Beachie Creek Fire. Based on the **potential damage from fire rating**, name the three soil map units that have the highest risk of fire damage? (*3 points*)

_____

_____

_____

_____**/7**

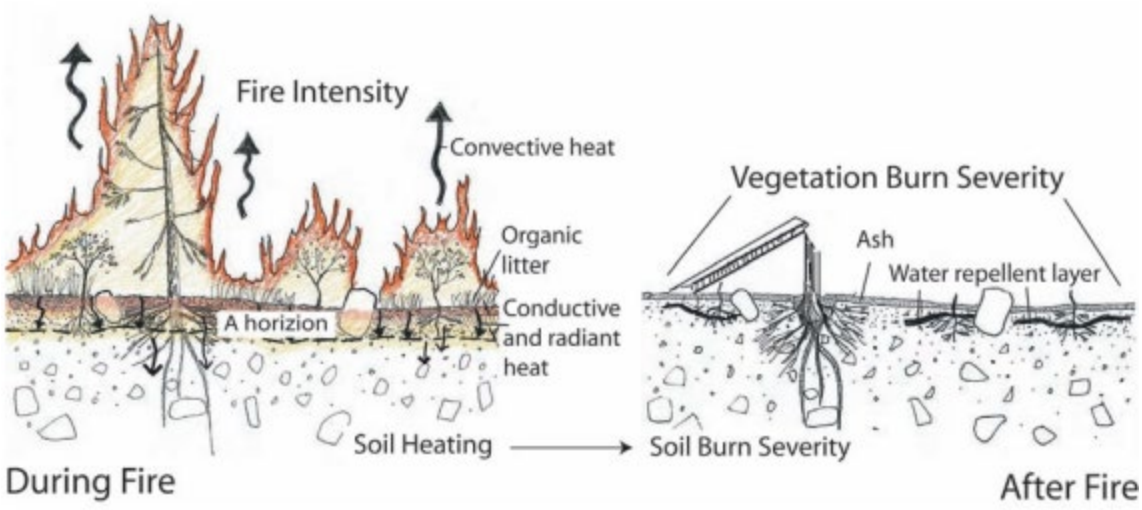


Figure 1. Illustrates the effect of fire intensity on above-ground vegetation and below-ground soil properties. Graphic modified by Mike Hankinson, National Park Service.

30) Luckily, because the Beachie Creek fire was pushed by winds so quickly across the landscape, most of the area did not stay hot long enough to burn deep into the soil profile. While the organic layer was burned off, the underlying mineral soils were only affected in the top centimeter or so. After the fire was out, much of the area was covered in needles from branches that remained in the trees, replenishing the organic layer and acting as a mulch against fall rains.
Based on your answer to question 29, which soil properties (name at least two) would you expect to have the <u>least</u> fire impacts to the soil? (*3 points, hint: look at the rating reasons for Potential for Damage by Fire*)

_____
_____
_____

_____

31) What practices would you recommend the USFS utilize to reduce erosion in the burned area? (*1 point*)

_____
_____

_____

_____

_____**/4**

32) What is the difference between soil and dirt? (*3 points*)

_____

_____

_____

_____

_____**/ 3**