

## Soils and Land Use - 2010 Learning Objectives

### Students will be able to:

1. In general, characterize the soil orders.
2. Understand the function of soil in the ecosystem.
3. Understand the processes and factors that influence soil formation from parent material.
4. Understand the relationship between landscape features (such as slope, slope position, aspect, vegetation, etc) and soil development.
5. Identify soil physical, chemical and microbiological characteristics.
6. Describe how different quantities and qualities of organic matter affect soil physical and chemical properties.
7. Describe how organic matter affects soil fertility.
8. Describe how soil color can be used to as an indicator to other soil properties.
9. Describe soil structure; and how soil structure influences air and water movement within soil.
10. Describe soil bulk density; and the factors that affect soil bulk density.
11. Describe soil porosity. Distinguish between micro and macro-porosity of soil.
12. Describe relationship between soil bulk density and soil porosity.
13. Describe soil drainage. Distinguish between different soil drainage classes.
14. Describe relationship between soil bulk density, soil structure and soil drainage.
15. Describe relationship between soil bulk density and soil erosion.
16. Describe how soil bulk density affects plant growth.
17. Describe soil pH.
18. Describe the relationship between soil pH and nutrient availability.
19. Describe the effects of soil organisms on soil physical and chemical properties.

20. Describe the effects of soil erosion on the landscape and plant growth.
21. Identify erosion control methods.
22. Explain how soil characteristics and fertility can be altered in an ecosystem and identify the possible consequences of such changes.
23. Describe the possible effects of oil/gasoline spills on soil and their consequences on plant growth.
24. Describe the possible effects of climbing on soils of steep slopes and also soils in the valleys below.
25. Describe potential land uses for a given area based on soil physical and chemical properties.

**Application/Analysis:**

1. Identify soil horizons in a soil pit or photograph.
2. Describe and classify a soil profile in terms of the soil order.
3. Name the soil orders of Canada and identify them on a map.
4. Identify soil texture class from a soil pit or sample provided.
5. Use a soil triangle to determine soil texture class.
6. Use the Munsell soil color chart to determine soil color.
7. Classify soil structure according to aggregate characteristics
8. Explain the relationship between land use(s) and soil physical and chemical properties.

**Evaluation/Synthesis**

1. Describe how soil, water and air are interrelated.
2. Relate soil characteristics on site to existing vegetation.
3. Assess a site for its erosion potential.

4. Elaborate on how to implement erosion control.
5. Elaborate on how to improve soil quality.
6. Explain how soil compaction occurs.
7. Relate soil compaction to plant root growth.
8. Assess soil porosity in the field and try to compare bulk density from different horizons in a soil pit.
9. Assess a site for its current and potential land use. (I.e. is the current land use suitable for the soil characteristics; and if not what would be some recommendations.)