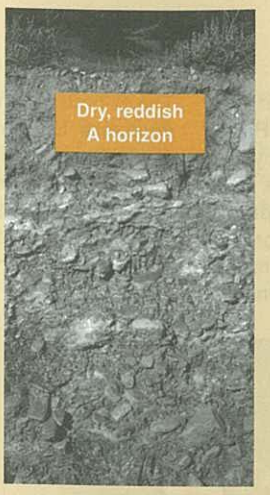
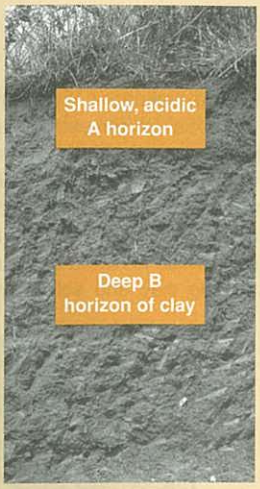
Soils In Different Climates

Soils are formed by the break down of rock and the mixing of inorganic and organic material. The soil profile is a series of horizontal layers that differ in composition and physical properties. Each recognizable layer is called a horizon. Soils have three basic horizons (A,B,C). The A horizon is the **topsoil**, which is rich in organic matter. If there is also a layer of litter (undecomposed or partly decomposed organic matter), this is called the O horizon, but it is often absent. The B horizon is a **subsoil** containing clay and soluble minerals. The C horizon is made up of weathered **parent material** and rock fragments. These horizons may be variously developed depending on whether or not the soil is mature. Mature soils have had enough time to develop distinct horizons. Immature soils have horizons that are lacking.



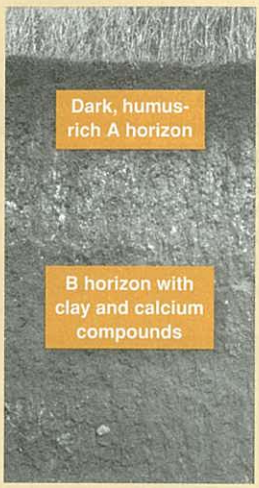
ARID REGIONS

Desert soils are alkaline mineral soils with variable amounts of clay, low levels of organic matter, and poorly developed vertical profiles.



HUMID TROPICS

Tropical soils: Leaching and chemical weathering make these soils acidic. Aluminum and iron oxides accumulate in the deep B horizon.

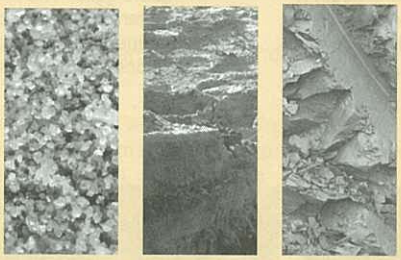


MID-LATITUDES

Grassland soils: Mature, alkaline, deep, well drained soils. They are typically nutrient-rich and productive with a high organic content.

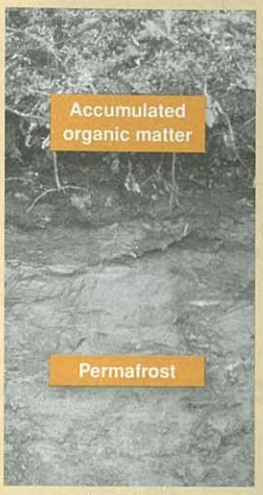
Soil Texture

Soil texture depends on the amount of each size of mineral particle in the soil (sand, silt, and clay sized particles). Coarse textured soils are dominated by sand, medium textures by silt, and fine textured soils by clay.



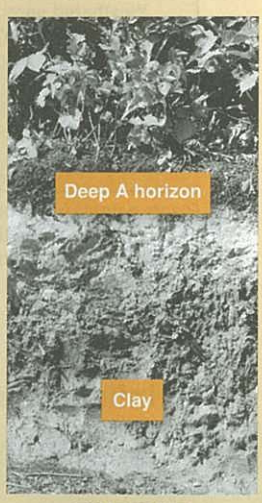
SAND ...feels gritty | SILT ...feels silky | CLAY ...feels sticky

decreasing particle size



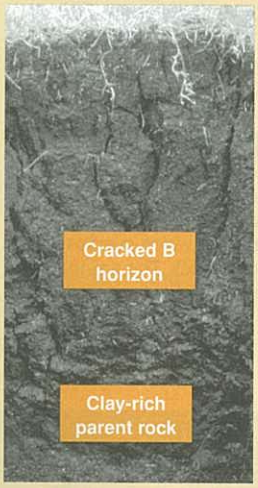
POLAR REGIONS

Very low temperatures slow the decomposition of organic matter and maintain the permafrost layer in these frozen soils.



TEMPERATE

Weathered forest soils: Well developed soils with a deep organic layer and accumulated clay at lower levels.



SEASONALLY WET

Swelling soils: Marked seasonal rainfall results in deep cracks as the soil alternately swells and shrinks.

3. Describe the role of soil organisms in soil structure and development: _____

_____

For questions 4 to 5, circle the letter with the correct answer:

4. The A soil horizon:
   - A. Is located below the O horizon
   - B. Is rich in organic matter
   - C. Can vary in thickness
   - D. All of A,B and C.

5. Silt particles:
   - A. Are smaller than sand particles
   - B. Feel gritty when moistened
   - C. Form from organic material
   - D. Form fine textured soils.

6. Identify which feature of a soil would most influence its:

   (a) Fertility: _____ (b) Water-holding capacity: _____

7. Explain how the characteristics described below arise in each of the following soil types:

   (a) Accumulation of organic matter in the frozen soils of the Arctic: _____

   _____

   (b) Shallow A horizon and poorly developed vertical profile of a desert soil: _____

   _____