

Objectives:

1. Know the difference between rocks and minerals.
2. Differentiate igneous, metamorphic and sedimentary rocks and examine their mineral components.
3. Relate rock texture and composition to weathering rate and soil development.
4. Become familiar with soil horizon identification and horizon designation.

Exercises:

1. Minerals: Write the names of the groups of silicate minerals (e.g., nesosilicates, tectosilicates, etc.), identify one mineral in each group and write its composition. Rank these groups of silicates on the basis of ease of weathering. What factors affect weatherability?

2. Rocks: Identify the dominant processes responsible for the formation of the three main rock types (igneous, metamorphic, sedimentary).

Give an example of a fine-grained, mafic rock and identify three minerals that are likely present.

How would soil texture and color of a soil formed from basalt compare with texture and color of a soil formed from granite, other factors being the same?

What is a main difference between schist and gneiss?

What kinds of soil properties would you expect would result from the weathering of limestone under humid conditions? Under arid conditions?

3. Soil weathering profiles: Note soil color, structure, clay films and rock fragment content for the weathering profiles from the three different parent materials. How are soil properties affected by the properties of the parent material? What other kinds of information do you need to make interpretations about the genesis of these soils?
4. Soil monoliths: Sketch and describe any four monoliths. Include horizon depths, horizon boundaries, and horizon designations. Note relationships between soil properties and the environment in which the soils occur. Please do not touch the monoliths, as they are quite fragile.