Student Outcome

Describe the various site characteristics.

Learning Objectives

1. Explain how landform affects land use.
2. List the major landforms.
3. Explain how percent slope is determined.
4. Explain the relationship between percent slope and water erosion.
5. Explain how you identify parent material.
6. Describe the effect of stoniness on land use.
7. List the factors which affect water erosion.

Grade Level Expectations

SC/ES/3/A/09-11/c

Resources, Supplies & Equipment, and Supplemental Information

Resources

1. PowerPoint Slides
   - Ppt 1 – Reading Slope With an Abney Hand Level or Clinometer
   - Ppt 2 – Judging Soil Slope
   - Ppt 3 – Slope Diagram Showing Feet Fall Per 100-Foot Distance

Supplies & Equipment

- Soil Judging Scorecard (found on DESE’s website)
- Abney level or clinometer

Supplemental Information

1. Internet Sites
2. **Print**
Interest Approach

Discuss site evaluation as it relates to soil judging. Introduce the Soil Judging Scorecard (found on DESE’s website) and explain the section on Site Characteristics.

Communicate the Learning Objectives

1. Explain how landform affects land use.
2. List the major landforms.
3. Explain how percent slope is determined.
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<tr>
<th>Instructor Directions</th>
<th>Content Outline</th>
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<tbody>
<tr>
<td><strong>Objective 1</strong></td>
<td>Explain how landform affects land use.</td>
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</table>
| *Discuss why site evaluation is just as important in soil judging as a description of each horizon. Take a field trip and evaluate a landform.* | 1. Site characteristics  
   a. Runoff  
   b. Erodibility  
   c. Internal drainage  
   2. Management decisions  
   a. Choice of crops  
   b. Tillage systems  
   c. Mechanical practices  
   d. Drainage systems  
   e. Irrigation |
| **Objective 2**       | List the major landforms. |
| *Discuss landforms in your area and procedures for evaluation.* | 1. Uplands  
   2. Foot slopes  
   3. Alluvial fans  
   4. Flood plains  
   5. Stream terraces  
   6. Sinkholes |
| **Objective 3**       | Explain how percent slope is determined. |
| *Discuss the importance of slope and how it affects the use and management of the soil. Demonstrate the use of an Abney level or clinometer to measure slope. Since your students will not have instruments to judge slope,* | 1. Place two stakes a certain distance apart (run) on the slope.  
   2. Calculate the difference in the two elevations (rise).  
   3. Divide the rise by the run.  
   4. Change fraction to percentage. |
### Instructor Directions

**Objective 4**

*Discuss with students how a slope’s length, shape, and gradient determine erodibility. Also discuss how the aspect of a slope influences moisture and plant growth as it relates to erosion.*

1. The greater the percent slope (gradient), the higher the erosion rate.
2. The steeper the slope, the greater the runoff.
3. As length increases, so does volume and speed of runoff water.

### Content Outline

**PPt 1** - Reading Slope With an Abney Hand Level or Clinometer

**PPt 2** - Judging Soil Slope

**PPt 1** - Slope Diagram Showing Feet Fall Per 100-Foot Distance

**Objective 5**

*Discuss parent material and how they are developed.*

1. Parent material is determined by comparing upper horizons with C and R horizons.
   a. C horizons usually represent original parent material.
   b. Landforms of a soil indicate the kind of parent material.
   c. Geology of an area provides clues to parent material.
   d. Abrupt changes may indicate two parent materials.
2. Six types of common parent materials have their own characteristics.
   a. Residuum: unconsolidated, weathered mineral material
   b. Alluvium: sand, silt, and clay sediments deposited by flooding
   c. Loess: clays and silts deposited by wind
   d. Eolian sand: sand dunes deposited by wind action

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### Instructor Directions

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<tr>
<td>e. Glacial till: clay, silt, sand, and gravel transported by glaciation</td>
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<tr>
<td>f. Colluvium: loose soil and rocks transported down steep slopes</td>
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#### Objective 6

**Describe the effect of stoniness on land use.**

- Stoniness interferes with tillage
- Can make cultivated crops impractical – could still work for hay crops or improved pasture
- Can prevent any agricultural improvements – use as native pasture or range
- Rockiness also limits cultivation

#### Objective 7

**List the factors which affect water erosion.**

1. **Slope**
   - Steepness of slope
   - Length of slope
2. **Runoff**
   - Soil texture
   - Permeability and infiltration
   - Soil depth
   - Vegetative cover
   - Climate

### Application

**Other activities:**

1. Tour local farms and observe the six general landforms that are common in the state.
2. Invite your Natural Resources Conservation Service (NRCS) representative to speak to your class.
3. Show a slide set of soil erosion to illustrate types and effects of erosion.

### Closure/Summary

Land forms have characteristic shapes and are produced by natural geologic processes. The six general landforms that commonly occur in the state are uplands, foot slopes, alluvial fans, flood plains, stream terraces, and sinkholes. There are five major characteristics used in a site evaluation: landform, slope, aspect, parent material, and stoniness. Both slope steepness and slope shape are important considerations in a site evaluation.

### Evaluation: Quiz

**Answers:**

1. c
2. b
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<td>10. a</td>
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<td>11. Rise ÷ Run = % Slope</td>
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<td>12. 10%</td>
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<tr>
<td>13. a. Uplands</td>
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<td>b. Flood plain</td>
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<td>14. a. Convex</td>
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<td>b. Concave</td>
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<td>c. Linear</td>
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<td>15. a. Slope shape</td>
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<td>b. Slope length</td>
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<td>c. Slope gradient</td>
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