



Course: AG-NR-03.411 Natural Resources Management
Unit 4: Soil Conservation

Lesson 4: Appraising Environmental Impact

Georgia Performance Standards:..... AG-NR-6
ACADEMIC STANDARDS..... ELA9LSV1, ELA9LSV2, SCSH2, SCSH9, SEV2

Objectives:

1. Define soil degradation and assess the impact it has on the environment.
2. Categorize different types of soil erosion.
3. Explain the effect agricultural pesticides and other chemicals have on soil properties and characteristics.
4. Interpret the effect waste disposal has on soil properties and characteristics.
5. Consider ways soil degradation could be limited.

Teaching Time: 5 hours

Grades: 9-12

Essential Question: What causes soil degradation?

Unit Understandings, Themes, and Concepts:

Students will learn about the impact of soil degradation, as well as the factors that cause it, namely: erosion, agricultural pesticides and chemicals, and waste disposal.

Primary Learning Goals:

Students will be able to explain the factors that cause soil degradation, as well as what can be done to prevent this process from occurring.

Students with disabilities: For students with disabilities, the instructor should refer to the individual student's IEP to insure that the accommodations specified in the IEP are being provided within the classroom setting. Instructors should familiarize themselves with the provisions of Behavior Intervention Plans that may be part of a student's IEP. Frequent consultation with a student's special education instructor will be beneficial in providing appropriate differentiation within any given instructional activity or requirement.

Assessment Method/Type:

<input type="checkbox"/> Constructed Response	<input type="checkbox"/> Peer Assessment
<input checked="" type="checkbox"/> Combined Methods	<input type="checkbox"/> Selected Response
<input type="checkbox"/> Informal Checks	<input type="checkbox"/> Self Assessment

References:

- Applied Environmental Science*. The National Council for Agricultural Education. Alexandria, VA 1996.
- Hassett, J.J. & Banwart, W.L. (1992). *Soil and their environment*. Englewood Cliffs, NJ: Prentice Hall Inc.
- Plaster, E.J. (1992). *Soil science and management*. Albany, NY: Delmar Publishers Inc.
- Wild, A. (1993). *Soils and the environment: An introduction*. New York: Cambridge University Press.

Power Points:

[Pesticide Management Applying Pesticides Casey Oksa.ppt](#)

Materials and Equipment:

See above references for materials

Georgia Performance Standards:

AG-NR-6. Students will identify sources of waste and describe methods and procedures for managing waste that minimize environmental impact.

- a. Explain the effect of agricultural pesticides.
- b. Interpret the effect waste disposal has on soil properties and characteristics.
- c. Consider ways soil degradation could be limited.
- d. Describe the steps in municipal wastewater treatment and handling.
- e. Describe different animal waste treatment and handling systems.

Academic Standards:

ELA9LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.

ELA9LSV2 The student formulates reasoned judgments about written and oral communication in various media genres. The student delivers focused, coherent, and polished presentations that convey a clear and distinct perspective, demonstrate solid reasoning, and combine traditional rhetorical strategies of narration, exposition, persuasion, and description.

SCSh2 Students will investigate the flow of energy and cycling of matter within an ecosystem and relate these phenomena to human society.

SCSh9 Students will enhance reading in all curriculum areas.

SEV 2 Students will demonstrate an understanding that the Earth is one interconnected system.

TEACHING PROCEDURE

Introduction and Mental Set

Fill two bowls of soil with topsoil. Mix engine oil in one of the bowls of soil, and shredded paper in the other bowl. Then, plant soybeans in both bowls and water them frequently. Observe the bowls for plant growth for two weeks, and have students make predictions about how the plants will respond to each mixture. Explain that many people dispose of oil improperly by throwing or dumping it on the soil. There are serious implications of dumping oil and other chemicals on soil such as, no plant growth, pollution of groundwater, and sickness and death of animals that ingest some of these chemicals. Discuss the effect of soil degradation on the environment and how soil is affected by waste disposal.

Discussion

1. Class lecture on soil degradation effect on the environment.

Definition of soil degradation - Soil degradation refers to the loss of productivity of soil resulting from such processes as erosion (soil loss due to wind or water), salinization (accumulation of soluble salts), alkalization (accumulation of exchangeable sodium), waterlogging, depletion of plant nutrients, depletion of soil organic matter, deterioration of soil structure, pollution, and desertification.

Soil erosion is one of the most serious threats to long-term agriculture. The problem of erosion is intensified when poor soils are cultivated because the soils are less fertile, have lower organic matter contents and are on greater slopes.

Salinization, alkalization and waterlogging usually result from

improper irrigation practices. The problems of salinization, alkalization and waterlogging are caused by secondary soils and salts which are transported by erosion. The land ultimately affected is situated down stream (or down slope) from the irrigated land.

Depletion of plant nutrients, soil organic matter and the deterioration of soil structure often occurs when soils are cultivated with low levels of fertilizers and organic matter additions. The soils are "mined" of nutrients and as the fertility level falls, soil organic matter is lost and soil structure deteriorates. To be sustainable, agriculture must maintain a high level of fertility in soils which will promote a high level of organic matter and a stable soil structure.

Pollution of soil can occur when chemicals, industrial waste, human waste and livestock waste are handled improperly. A large accumulation of heavy metals, salts or an acute accumulation of chemicals can render soil unproductive.

Desertification of productive land is largely the result of overgrazing, deforestation and poorly fertilized cultivated crops. These activities remove the protective plant cover from the soil, lower the organic matter content of the soils, lower the soil's fertility and increase its susceptibility to erosion,

Deterioration of soil structure usually occurs through compaction of soil caused by years of tillage with heavy machinery.

2. **Identify classification of soil erosion.** Lead class discussion on types of erosion.
 - A. Splash erosion
 - B. Sheet erosion
 - C. Rill erosion

- D. Gullies
 - E. Wind erosion
- Define each type.

Splash erosion occurs when the impact of a rain drop shatters surface aggregates and loosens soil particles.

A soil grain can be thrown as far as five feet by a raindrop splash. Some of these particles float into soil voids, sealing the soil surface so water cannot readily infiltrate the soil. Some studies indicate that splash erosion can be responsible for up to 95 % of soil loss.

Sheet erosion is the removal of a thin layer of soil in a sheet on gentle slopes, or near the tops of steeper slopes. Water moves in tiny streams too small to be noticed, which gives the effect of losing soil in a thin sheet. Sheet erosion is especially dangerous because it can easily go unnoticed until subsoil appears.

Rill erosion is a visible series of many small channels on a slope. Water tends to collect in channels, picking up energy as it runs down the slope. As a result, running water carves out small but visible channels called rills. A rill can be covered by tillage. Rill erosion can be dangerous because rills being filled in by each tillage may go unnoticed.

Ephemeral gullies are large rills. The channel is small enough that tillage equipment can cross it and largely, but not completely, fill it in by tillage. The distinction between regular rill and ephemeral erosion is also important. Tillage does not fill in ephemeral channels, therefore they can act as a beginning for gully formation

Gully erosion is the most highly visible erosion. Gullies are so large that equipment cannot cross them. Gullies usually begin to

form near the bottom of a slope or on steep slopes, where running water has enough force to carve a deep channel. Gully heads may back up the hill as water running into the gully collapses the sides.

Wind erosion accounts for about one-third of soil loss in the United States, mostly in the great plain states. Dry areas with high winds are most likely to experience wind erosion. At greatest risk is soil kept bare by clean-till summer fallow. When the wind reaches 10-13 miles an hour at a height of one foot above the surface soil, grains begin to move. Wind erosion, like sheet and rill erosion, often goes unnoticed until subsoil appears.

Each type of erosion is important to understand for different reasons. Otherwise erosion may go unnoticed by the grower or land manager. Also different types of erosion require certain types of soil conservation practices.

Soil fertility is a major factor in soil conservation. By adding fertilizer and lime when needed to keep soils highly productive, we not only help conserve soil, but also aid in other areas of conservation.

High soil fertility produces a heavier plant growth that protects soil from washing and blowing away. Land that is protected with a good cover of grass or trees does not wash. In fact, under such conditions, soil is being formed faster than it is eroded away. Keeping land covered as much as possible is one of the best ways to prevent erosion, but plants will not grow abundantly unless the soil is fertile. Heavy plant growth resulting from high fertility uses more water than growth on poor soil. This leaves room for the soil to hold more water and reduces runoff. Thus, fertile soil produces more plant growth which in turn improves the soil by increasing organic matter and improving soil structure and fertility. Complete Lab: How Does Fertilizer Affect Plant Growth

3. Class lecture and discussion on effect of pesticides on soil.

Cover topics:

- A. Adsorption
- B. Decomposition
- C. Volatilization

Modern agriculture and land development practices utilize a variety of materials to provide nutrients, control weeds and pest, or regulate plant growth. The addition of these chemicals, whether synthetic or natural, to provide nutrients or to control weeds or pests must be based on an understanding of the processes that control the fate of these chemicals in the environment.

It is estimated that insects, weeds, plant diseases, and nematodes account for losses exceeding \$20 billion in the United States and exceed \$100 billion worldwide and would be much higher without herbicides and pesticides (Hasset & Banwart, 1992).

Fertilizers are also very important chemicals that interact with the soil and the environment. Any material that is applied to the soil to supply nutrients essential for plant growth can be considered a fertilizer. The term fertilizer, therefore includes natural materials, such as organic compost, green manures, cover crops, and commercial fertilizers or materials containing one or more of the primary plant nutrients: nitrogen, potassium, or phosphorus. Fertilizers have become increasingly important because much of the topsoil which contains the majority of nutrients has eroded away.

The dangers of chemical substances in the soil is that they may leach through the soil and contaminate groundwater. They can be very concentrated in one area of soil and inhibit plant growth or make animals and humans sick, they can wash off of land and contaminate fresh water supplies, and they can adhere to soil particles and erode

into freshwater supplies.

There are three main processes that control the fate of chemicals in the soil. These processes are **adsorption** by the solid phase, **decomposition**, and **volatilization**.

Adsorption - The process by which atoms, molecules, or ions are taken up and retained on the surfaces of solids by chemical or physical binding (molecules of the chemical binding to soil particles).

Decompose - To separate or resolve into constituent parts or elements, or into simpler compounds, to distinguish by analysis. In soil this usually occurs through biochemical processes carried out by soil microorganisms.

Volatilization - Act or process of volatilizing or state of being volatilized.

Volatile - Easily passing away by evaporation, readily vaporizable.

Thus, chemicals can stick to soil particles through adsorption, be decomposed by soil microorganisms, or be volatilized and evaporate into the atmosphere.

Geologists have wondered why certain areas are more affected by acid rain than are other areas. Geologists found that certain rocks neutralized acid rain. These rocks always contained calcium carbonate (a buffer that helps control changes in pH). Chalk is a soft type of calcium carbonate. When calcium carbonate rocks are powdered, the result is frequently called lime. When lime is added to soil and water, it raises its pH (makes it less acidic). However, this procedure must be done every year because more acid rain is continually falling. It takes a large quantity of calcium carbonate to neutralize a small amount of acid rain. Therefore, if a large lake or field is acidic, each year large amounts of calcium carbonate would have to be added. This is a very expensive solution to the problem of acid rain. Complete Lab: How

Does Calcium Carbonate Affect Acid Rain?

4. **Effect of soil by waste disposal.** Teacher lead class discussion to identify the following factors:
- A. Sewage sludge
 - B. Domestic solid waste
 - C. Industrial waste
 - D. Animal waste

Waste disposal in the United States pertains to four major areas of waste. These areas are: sewage sludges, domestic solid waste, industrial waste, and animal manures.

Large urban areas create a great amount of **sewage sludge**; therefore, disposing of sludge is no small problem. Some methods of disposing sewage sludge are incineration, and depositing it in landfills. Where these methods are not suitable, adequate, or cost effective; land application is sometimes used. Land application of sewage sludge has four major purposes (uses):

- (1) agriculture utilization as a source of fertilizer nutrients, as well as improving the physical characteristics of the soil,
- (2) forest utilization as a means of enhancing forest productivity,
- (3) land disposal where the primary goal is to dispose of sludge rather than improving the physical soil conditions or as a source of nutrients, and
- (4) land reclamation where sludge is used to reclaim strip-mined areas and other disturbed sites.

Sewage sludge can be very beneficial to soil, however, some sewage sludge contains metals such as cadmium, mercury, lead, zinc, copper, and nickel and some potentially contaminated organic compounds that make them unacceptable for land application. The

sewage sludge and soil it is applied to should be thoroughly tested to make sure soil is not contaminated. Soil pH and Cation Exchange Capacity (CEC) also have an affect on the way soil interacts with heavy metals and organic compounds.

Domestic Solid Waste. Trash collection in the United States is a huge and growing concern. Not only has the U.S. population grown by about 40 million people from 1970 to 1990, but the amount of solid waste generated per person has increased by approximately 50%. It has been estimated that every man, women, and child generates approximately two kilograms of trash per day. This totals over 200 million tons of domestic solid waste each year. (Hasset & Banwart, 1992).

Most municipal solid waste goes into landfills made from natural ravines or holes dug into the earth. Usually landfills are constructed with impermeable layers of clay to prevent leaching of chemicals and pesticides that households use. Most landfills are constructed to meet EPA standards for protection of the environment.

When a landfill is completed, it is usually capped with a layer of impermeable clay under topsoil, and seeded with grass. Landfills are susceptible to leaching however, which can cause ground water contamination. In addition, construction can be difficult on these sites because of settling.

Industrial Waste. Many manufacturing plants use toxic chemicals in their manufacturing plants and toxic chemicals can be by-products of manufacturing processes. Show TM-1, 2 and 3 for class discussion on the three methods of land management of industrial waste. (1) deep well injection, (2) surface impoundments and (3) landfills.

Deep well injection of industrial waste is accomplished by pumping the waste through a protective casing into a bed or porous layer of stones. This layer of porous stones (strata) is between layers of impermeable clay and below the water table.

The problems that can arise with deep well injection are leaks at the surface, corrosion of the well casing, and failures of the

impermeable layers of clay or bedrock.

Surface impoundments are small ponds where waste waters containing very low levels of solid waste can be evaporated. Surface impoundments are constructed with impermeable layers of clay topped by plastic liners. The problems that may arise using surface impoundments are finding layers of clay that are truly impermeable, failure of plastic liners, and excessive discharge of wastewater causing ponds to overflow.

Landfills for industrial solid waste are similar to municipal solid waste disposal sites but are designed to be protected from leaching by clay and plastic liners and sometimes by a leachate collection field and pumping system to remove any leachate. The effectiveness of this waste disposal system is dependent on the impermeable clay layer, the plastic liner, and the maintenance and operation of the leachate system.

Animal Manures. The livestock and poultry industry generates in excess of 1.7 billion tons of manure per year (Kasset & Banwat, 1992). Manure can be successfully applied to agricultural land. Some benefits of applying manure to agricultural land are: improving tilth by increasing organic matter, improved hydraulic conductivity, decreasing bulk density of soil, and increasing exchangeable cations and nutrient levels (Nitrogen, Phosphorus, and Potassium). When animal manures are applied at reasonable rates to cropped soil, their use is both environmentally acceptable and an economic advantage to growers. When applied too heavily there is danger of excess salts from the manures, and nutrient imbalance. Feedlots that hold up to 100,000 cattle must protect against manure runoff into streams and lakes. When manure runs into streams and lakes there is a microbial breakdown of the organic matter which causes a biological oxygen demand (BOD). This can result in a killing of aquatic life due to a lack of oxygen.

5. Lead class in discussion on how soil degradation can be limited.

Soil degradation can only be limited through sound management of

soil which requires knowledge of the processes which degrade soil and the processes which improve soil. To prevent soil erosion proper soil conservation practices should be used.

To prevent other types of soil degradation, irrigation should be properly utilized where irrigation is needed. Also, nutrients and organic matter in soil should be preserved and replaced.

Pollution should be prevented by properly handling chemicals and waste materials and desertification should be avoided by proper grazing utilization, proper forestry management and proper cultivation techniques.

SUMMARY

Soil is a valuable natural resource that can be degraded. Individuals can protect and conserve soil through appropriate practices.

Evaluation

Written test

Lab: How Does Fertilizer Affect Plant Growth

Purpose: To demonstrate how fertilizer can aid in soil conservation.

Materials and Supplies: Two quart size flower pots
Soil with low fertility (subsoil from an eroded bank or other source) Small amount of sand
Mortar and pestle (or other method of grinding up fertilizer) Seeds of tomatoes, beans, corn, or wheat
Nitrogen fertilizer
Phosphorus fertilizer

Procedures:

1. Grind the fertilizer materials in the mortar until they are very fine.
2. Place one pint of soil on a sheet of paper.
3. Add 1/2 of a teaspoon of nitrogen fertilizer and 1/2 of a teaspoon of phosphorus fertilizer to the pint of soil.
4. Mix these fertilizers thoroughly in the soil.
5. Place a pint of the unfertilized soil in one of the pots and finish filling the pot with the fertilized soil.
6. Fill the second pot completely with unfertilized soil.
7. Plant a few of the same type seeds in each pot.
8. Cover the soil in the pots with about 1/4 inch of sand to prevent the soil from crusting.
9. Which type of soil will promote the best plant growth?

Hypothesis: _____

10. When plants are well established thin plants to the same number in each pot.
 12. Observe the plants growth for several weeks.
 13. Reject or Accept **Hypothesis:** _____
-

Explanation: _____

Discussion Questions:

- How does fertilizer affect plant growth?
- How could fertilizer be used to aid in soil conservation?
- Will fertilizer affect all types of plants in the same way?
- What are some dangers of fertilizers?
- How should we handle the dangers of fertilizers?

Additional Methods of Completing the Experiment:

- Repeat the experiment using several different types of soil.
- Repeat the experiment using varied amounts of fertilizers.
- Repeat the experiment using varied kinds of seeds.

Source: Teaching soil and water conservation: A classroom and field guide (1988).
Natural Resources Conservation Service, United States Department of
Agriculture.

Lab: How Does Calcium Carbonate Affect Acid Rain

Purpose: To illustrate how calcium carbonate (lime) affects a lake or field's pH.

Materials Needed: Two peanut-butter jars Chalk (calcium carbonate)
White vinegar Measuring cup
Distilled water Tweezers
Hand lens or magnifying glass
pH paper and color chart (available at aquarium/pet shops)

Procedures:

1. Place 2 cups (about 500 ml) of distilled water in one jar and 2 cups (about 500 ml) of vinegar in the second jar.
2. Using the tweezers, dip a small piece of pH paper into the jar with distilled water and remove.
3. Immediately compare the color of the pH paper with the color chart.
4. Repeat the procedure with the vinegar. (The vinegar will act as acid rain.)
5. Break three long pieces of chalk into very small pieces and place them in the water jar.
6. -Break three more long pieces of chalk into small pieces and place them in the vinegar jar.
7. How will the calcium carbonate affect the vinegar?

Hypothesis: _____

8. Wait one hour and then test each jar with pH paper. Record the pH of each jar.
9. Record what you see with a hand lens at the bottom of each jar. Compare the chalk that is in each jar.
10. Dump the liquids down the sink and properly dispose of the chalk.

Reject or Accept Hypothesis: _____

Explanation: _____

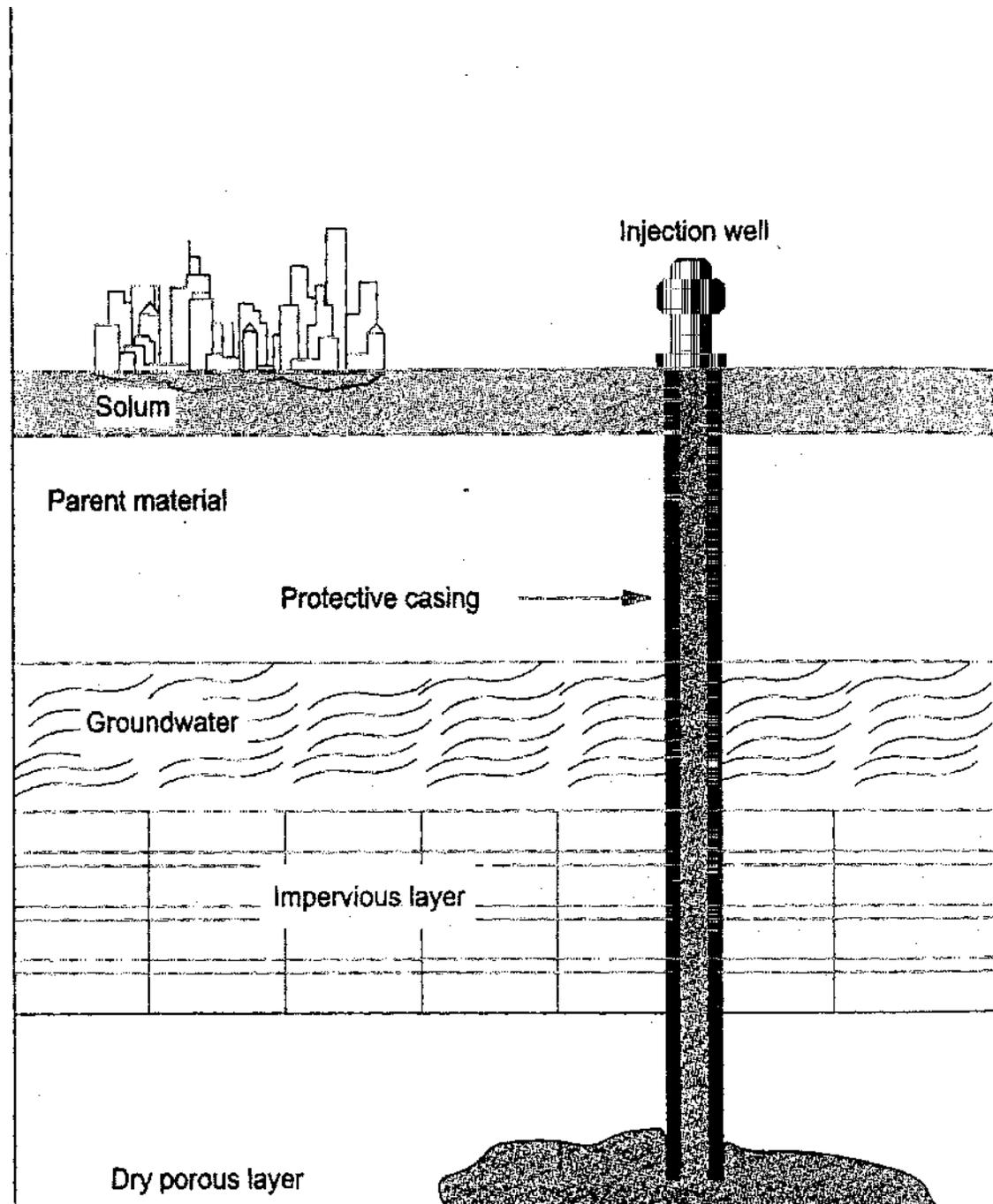
Discussion Questions:

- Which jar has the most acid after one hour?
- What did the chalk do to the pH of the distilled water?
- What did the chalk do to the pH of the vinegar?

Additional Methods of Completing the Experiment:

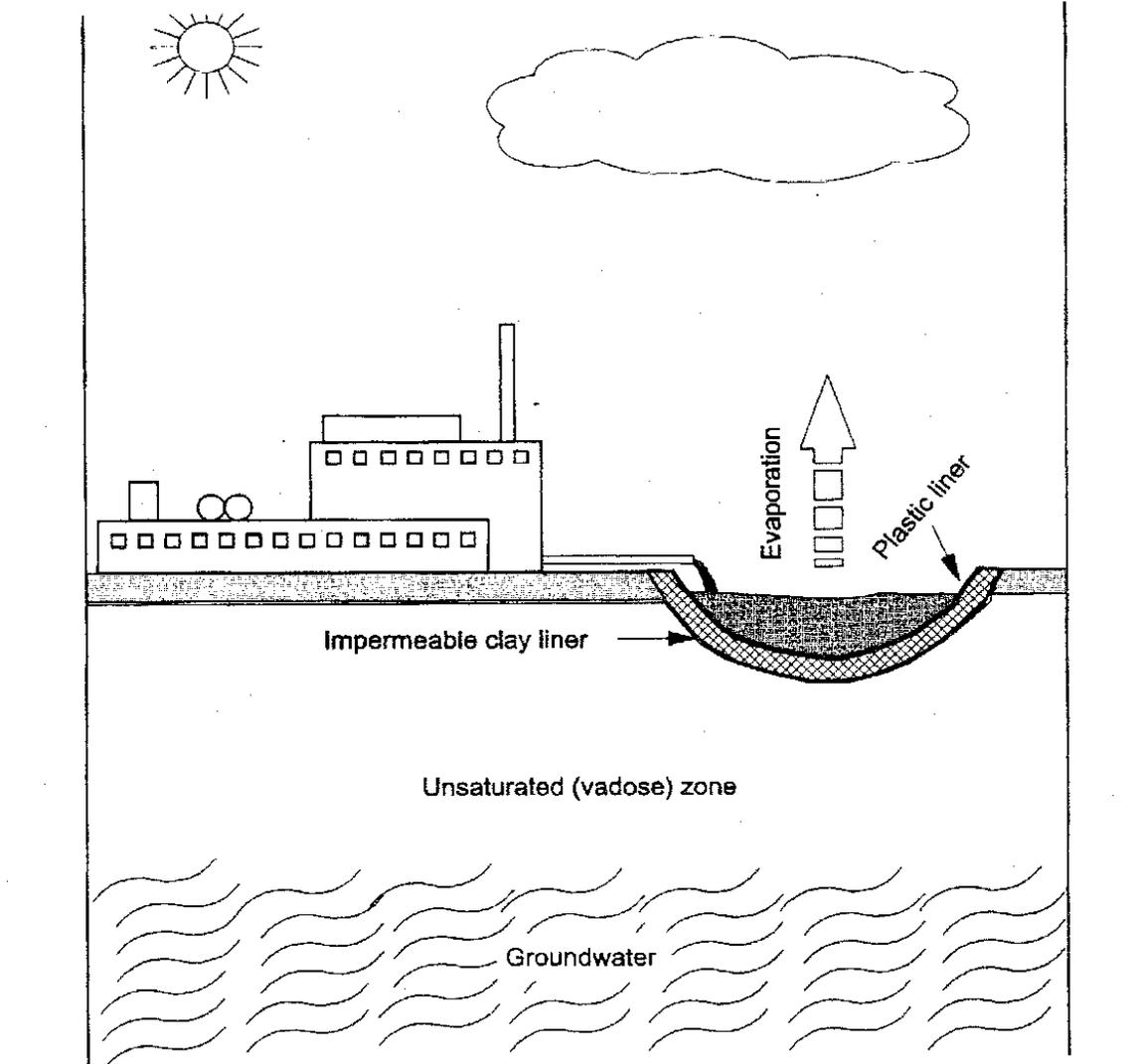
- Predict what would happen to the chalk and what would be the pH if you used half vinegar and half distilled water. Test your prediction.
- What happens when you use lemon juice rather than vinegar?
- What happens to the pH when you use only half a piece of chalk in the vinegar?

Courtesy: Barrow, L.H. (1991). Adventures with rocks and minerals.
Springfield, NJ: Enslow Publishers Inc.



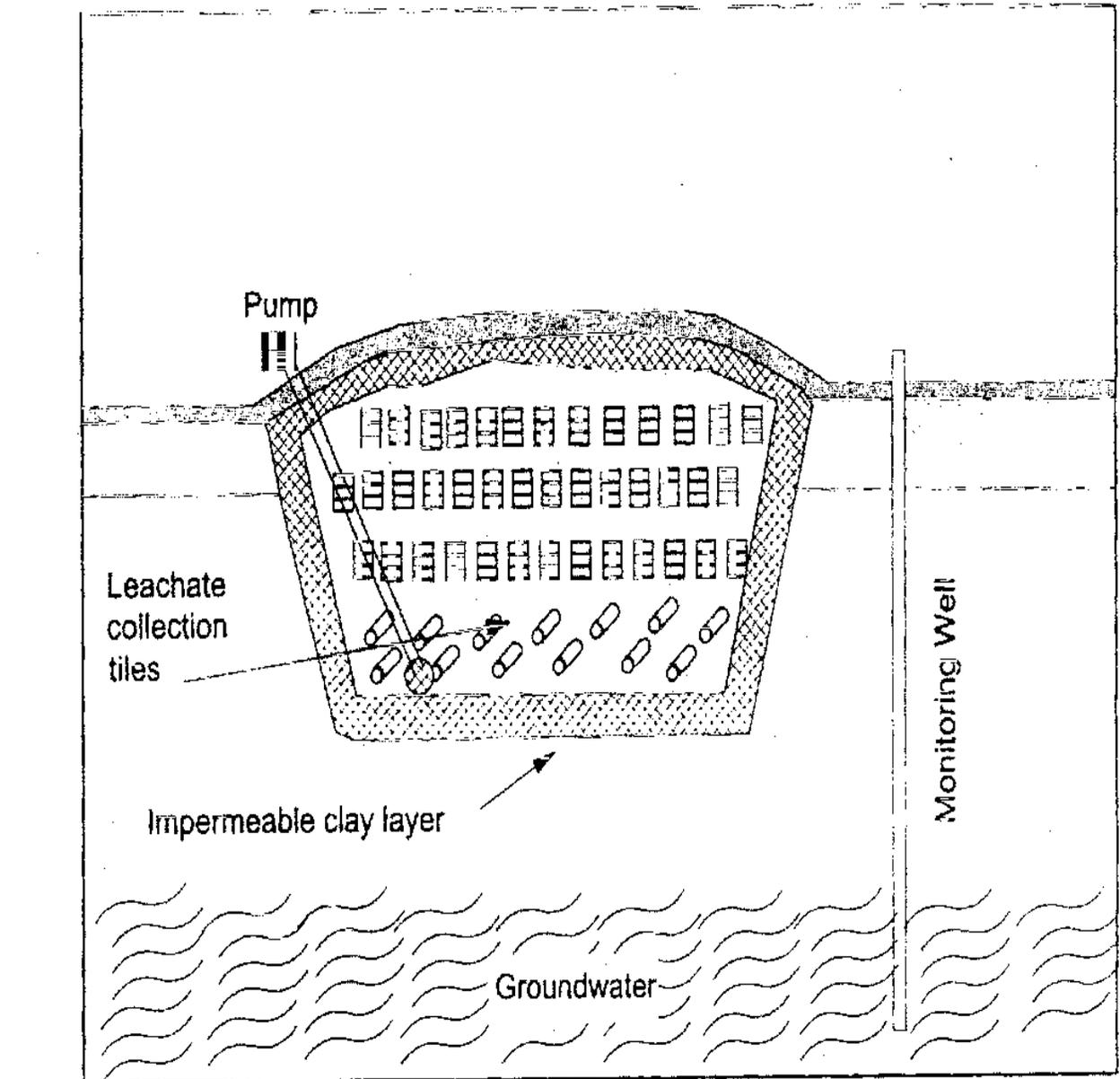
TM - 1 Deep Well Injection Disposal

SOILS AND THEIR ENVIRONMENT by HassettBanwart, ©1992.
Reprinted by permission of Prentice-Hall, Upper Saddle River, NJ.



TM - 2 Surface Impoundment Disposal

SOILS /AND THEIR ENVIRONMENT
by Hassett/Banwart, © 1992. Reprinted by
permission of Prentice-Hall, Upper Saddle
River, NJ.



TM - 3 Landfill for Industrial Solid Waste

SOILS AND THEIR ENVIRONMENT by HassettJBanwart, © 1992. Reprinted by permission of Prentice-Hall, Upper Saddle River, NJ.

Individual Learning Activity

Lesson: Appraising Environmental Impact

Assignment: Choose one of the topics below and research it. Write a report on your findings that answers the question or explains the concept and shows why it is relevant to your life.

1. Define soil degradation and assess the impact it has on the environment.
2. Categorize different types of soil erosion.
3. Explain the effect agricultural pesticides and other chemicals have on soil properties and characteristics.
4. Interpret the effect waste disposal has on soil properties and characteristics.
5. Consider ways soil degradation could be limited.

Minimum Requirements:

1. Paper must be typed in 12 point font and at least one page in length. The paper may be double-spaced.
2. At least two credible references must be properly cited.
3. All work must be original. No plagiarism! Any use of another's ideas without giving credit will result in a zero.
4. Papers will be graded on content (amount of good information, accuracy, etc.) and mechanics (grammar, spelling, and punctuation.)

Due Date:

Points/Grade Available:

Individual Learning Activity Rubric

<p>Content - offers current information on the topic chosen, thoroughly covers each aspect of the question, and demonstrates understanding and mastery of the lesson. The paper should include information and issues of state and local importance.</p>	<p>35 pts.</p>
<p>Critical Analysis - logical process of analyzing and reporting information that examines and explains the topic selected. The paper should go beyond simply listing facts and must include why the concept is relevant to the student's life.</p>	<p>25 pts.</p>
<p>Organization- The paper should have an orderly structure that demonstrates a logical flow of ideas.</p>	<p>15 pts.</p>
<p>Mechanics- spelling, grammar, punctuation, font size, double spacing, citation, etc. Essentially, the paper should meet all specifications and be executed following rules of proper written English.</p>	<p>15 pts.</p>

Group Learning Activity

Lesson: Appraising Environmental Impact

Assignment: Choose one of the topics below and research it. With your group, prepare a presentation to teach the class your concept.

1. Define soil degradation and assess the impact it has on the environment.
2. Categorize different types of soil erosion.
3. Explain the effect agricultural pesticides and other chemicals have on soil properties and characteristics.
4. Interpret the effect waste disposal has on soil properties and characteristics.
5. Consider ways soil degradation could be limited.

Your presentation should include the following:

1. A lesson plan outlining exactly what your group will teach and how the information will be taught
2. A Power Point of at least twelve slides
3. Notes containing the information the class will be responsible for (these can be printed and given to the class, written on the board, or part of the Power Point). A copy of the notes will be turned in to the instructor.
4. Some type of interactive activity for the class (game, problem solving activity, interactive model, etc.)
5. Your group must also prepare an assessment for the class. This assessment can be written or oral, but should show the instructor that the class understands and has retained the material being taught.

Due Date:

Points/Grade Available:

All work must be original. No plagiarism! Any use of another's ideas without giving credit will result in a zero.

Group Learning Activity Rubric

Lesson Plan - The group submits a thorough, detailed lesson plan highlighting the content and organization of their lesson.	10 pts.
PowerPoint - The group presents a Power Point of at least twelve slides that contains information and pictures vital to the lesson with additional information or examples for enhancement.	20 pts.
Interactive Activity - Some type of interactive activity is used to help teach the lesson. The activity should contribute to the mastery of content and involve the entire class in some way.	15 pts.
Assessment - A fair, thorough assessment is prepared and administered based on the information presented to the class. Poor grades on the assessment by a few members of the class are excusable, but if the entire class has difficulty, the points awarded in this category may be lowered at the discretion of the instructor.	15 pts.
Content - The group should cover the concept (within reason) in entirety. The group may study actual lesson plans to help decide what should be emphasized.	25 pts.
Overall Effect - The group is prepared, enthusiastic, and interesting, and the lesson flows smoothly.	15 pts.

Presentation Learning Activity

Lesson: Appraising Environmental Impact

Assignment: Choose one of the topics below, research it, and prepare a presentation that answers the question or explains the concept and shows why it is relevant to your life.

1. Define soil degradation and assess the impact it has on the environment.
2. Categorize different types of soil erosion.
3. Explain the effect agricultural pesticides and other chemicals have on soil properties and characteristics.
4. Interpret the effect waste disposal has on soil properties and characteristics.
5. Consider ways soil degradation could be limited.

Minimum Requirements:

Oral Report Option

1. Write a paper on one of the topics and orally present your work to the class.
2. Paper may be double-spaced and should be at least one page in length, resulting in a two to five minute presentation.
3. At least two references must be properly cited.
4. The presentation of the report will be graded secondary to the content of the paper.

PowerPoint Option

1. Presentation should be at least ten slides in length
 2. Presentation should include at least four photos.
 3. Presentation should be two to five minutes in length.
 4. Grammar and spelling will be graded by the same standards as any other written assignment.
 5. At least two references must be properly cited.
-

Poster Option:

- 1. Prepare a poster that answers/explains one of the topics. You will present your poster to the class.**
- 2. Your poster should include both text and graphics that help communicate your research.**
- 3. At least two sources of information should be properly cited on the back of the poster.**
- 4. Neatness and appearance of the poster will be graded.**
- 5. Poster presentation should last two to five minutes.**

Due Date:

Points/Grade Available:

**For all presentations: All work must be original. No plagiarism!
Any use of another's work or ideas without giving proper credit
will result in a zero.**

Presentation Learning Activity Rubric

<p>Content- offers current information on the topic chosen, thoroughly covers each aspect of the question, and demonstrates understanding and mastery of the lesson. The presentation should include information and issues of state and local importance.</p>	<p>40 pts.</p>
<p>Critical Analysis/Organization - The presentation shows a logical process of analyzing and reporting information that examines and explains the topic selected. The presentation should go beyond simply listing facts and must include why the concept is relevant to the student's life.</p>	<p>20 pts.</p>
<p>Presentation - The student makes a genuine effort to present, not just read the material. The student should present with confidence using techniques like eye contact and voice inflexion to make his or her point. Although content takes precedence over presentation, the experience of successfully presenting in front of a class is part of the basis of this assignment.</p>	<p>25 pts.</p>
<p>Mechanics- spelling, grammar, punctuation, font size, double spacing, citation, etc. Essentially, the presentation should meet all guidelines set forth and should be executed in proper written English. For the poster, this includes neatness and appearance.</p>	<p>15 pts.</p>

Teacher Notes

**Essential Question:
What causes soil
degradation?**
