

Lesson 5 Reducing Sediment

Overview

Lesson Five is about ways that we can reduce sediment that gets into the surface waters. It starts with using the experiment on % water in the soil, to explain that both soils and rocks can hold water. The aquifers are important because they supply over half of the water we use in this country. The difference between surface water and groundwater is illustrated. Sediment usually enters the surface water when it rains and the water runs off of bare soil into the surface waters. If the soil is covered by plants or mulches, sediment in the runoff is reduced. Best management practices for reducing sediment are learned such as contour farming, selective logging, retention ponds and silt fences. The lesson is finished with a worksheet reviewing the ways to reduce sedimentation.

Objectives

- Explain that soil as well as rocks can hold water.
- Define an aquifer as large underground areas of water bearing rocks.
- List examples of surface water such as lakes, streams, rivers and oceans.
- Recognize that half of the people in the United States get their drinking water from underground aquifers.
- State that sediment comes principally from bare soil that is carried to the surface water when water runs off of the soil during a heavy rain.
- List some sources of sediment such as surface strip mining, construction, erosion of agricultural land and clear cut logging.
- Recognize the importance of plants that cover the bare soil and prevent erosion during runoff.
- List ways to cover bare soil such as mulches and plants (cover crops).
- Define contour farming as making rows perpendicular to the slope of the hill to minimize soil erosion from runoff.
- Define retention ponds as a technique used in conjunction with building developments that slow the water down and reduce sediment in the surface waters.
- List ways to reduce sediment in the surface water such as silt fences, selective logging, restoration of bare land with cover-crops, contour farming, retention ponds, etc.

TEKS for 6th

Knowledge and skills

- (10) Earth and space. (B)
 (12) Organisms and environments. (E)

TEKS for 7th

(b) Knowledge and skills

- (4) Science investigation and reasoning. (A)
 (5) Matter and energy. (A) (B) (C)
 (8) Earth and space. (B) (C)

TEKS for 8th

(b) Knowledge and skills

- (9) Earth and space. (C)
 (11) Organisms and environments. (C) (D)

Recommended Procedure

1. Pick up the water cycle worksheet from the previous lesson.
2. Show the PowerPoint for Lesson 5. There is no overhead for lesson 5 because there are so many valuable pictures of ways to reduce sediment that we urge you to secure means to show this power point to the students. If you have no means to project the PowerPoint, you might have the students view the power point in the computer lab. Have the students take notes on the vocabulary.
3. After viewing the PowerPoint for lesson 5 the students should be given the review sheet on reducing sedimentation. I would suggest printing the pages of the power point and spreading them randomly around the room. The students then wander around looking at the overhead slides to help them fill in the review worksheet.

Materials needed for this lesson

The teacher needs to secure a means of showing the power point or reserve the computer room. It is advisable to print the slides of the power point that will help answer the review sheet.



Lesson 5: Review and Study Guide of Ways to Reduce Sedimentation- a nonpoint Source of Pollution

Student Activity

There are over 70,000 types of soil and we are going to examine three major types.

Instructions:

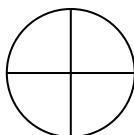
The presentation you just saw has all the answers to these questions, but you need time to review and assimilate the information. First try to answer these questions from memory and the notes you took. Hard copies of the slides from the presentations will be placed randomly around the room for you to examine and finish answering the questions you couldn't answer on your own. The order is not important, understanding the major concepts, and solutions to the problem of sedimentation are important.

A remedy is a solution to a problem. For example, the best remedy for bare soil is to grow plants on that soil.

1. List four main causes of bare soil and the remedies

Bare Soil From	Remedies

2. Show the percent of people who use ground water in the U.S. by shading in this pie diagram.
3. When does runoff occur?
4. What is erosion and what agents cause it?
5. What is strip mining? Why do they strip mine?
6. What is selective cutting?
7. Is it better or worse than clear cutting?
8. What is contour farming?



Lesson 5: Review and Study Guide of Ways to Reduce Sedimentation- a nonpoint Source of Pollution

9. What are silt fences?

10. Where would you expect to see silt fences?

11. Do you have more erosion on flat bare land or slanted bare soil? (circle one)

12. What are retention ponds?

13. Are they good or bad for water quality? Explain

14. What are cover crops?

15. Most sediment comes from _____ soil and all these remedies are

designed to stop _____ a nonpoint source of pollution.

Name _____**Review and Study Guide of Ways to Reduce Sedimentation, a nonpoint Source of Pollution**

Instructions: The presentation you just saw has all the answers to these questions, but you need time to review and assimilate the information. First try to answer these questions from memory and the notes you took. Hard copies of the slides from the presentations will be placed *randomly* around the room for you to examine and finish answering the questions you couldn't answer on your own. The order is not important, understanding the major concepts, and solutions to the problem of sedimentation is important.

A **remedy** is a solution to a problem. For example, the best remedy for bare soil is to grow plants on that soil.

1. List four main causes of bare soil and the remedies.

Bare Soil From:

Remedies

<i>Construction</i>	<i>Silt fences or retention ponds</i>
<i>Mining</i>	<i>Restore the land with plants</i>
<i>Logging</i>	<i>Selective logging</i>
<i>Farming or agricultural fields</i>	<i>Contour farming or cover crops</i>

2. Show the percent of people who use ground water in the U.S. by shading in this pie diagram. *Shade in half of the circle for 50%.*
3. When does runoff occur? *Runoff occurs when it rains and excess water runs off of the land.*
4. What is erosion and what agents cause it? *Erosion is when wind or water carry particles of sediment from one location to another. The agents are the wind and the water.*
5. What is strip mining? Why do they strip mine? *Strip mining is done by removing the earth above the ore. It is done to get to the valuable ores in the earth such as copper or coal.*
6. What is selective cutting? *Selective cutting is when only selected trees are removed from the land instead of clear cutting all of the trees.*
 - a. Is it better or worse than clear cutting? *Selective cutting is better than clear cutting.*
7. What is contour farming? *When farmers plow the rows perpendicular to the slope of the land to reduce sediment from going into the runoff.*
8. What are silt fences? *Silt fences are temporary fences used to hold back the silt from the bare soil. They reduce the sediment that goes into the surface waters.*
Where would you expect to see silt fences? *Construction sites*
9. Do you have more erosion on flat bare land or slanted bare soil? (circle one) *circle "slanted bare soil"*
10. What are retention ponds? *Depressions made in building developments to slow the water down.*
 - a. Are they good or bad for water quality. Explain *Retention ponds help water quality because the sediment in the water settles out in the pond, not in the rivers.*
11. What are cover crops? *Crops used to cover the bare soil. They enrich the soil and keep the soil in place.*
12. Most sediment comes from bare _____ soil and all these remedies are designed to stop sedimentation, a nonpoint source of pollution.

