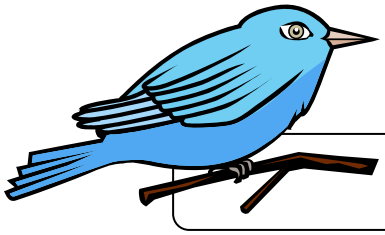

Erosion Explosion

Summary:
Students will identify their misconceptions on what erosion is and why soil conservation is important globally.

Background Information:
Erosion by wind and water occurs naturally but is accelerated by human activity. In many regions farming, construction, mining, and other activities have left soil relatively unprotected from erosion. Because of this, topsoil is being removed more quickly than natural processes can restore it. As of 2001, one estimate indicated that soil in the United States was being eroded at a rate17 times higher than the rate at which it was formed. About 90% of available cropland was losing soil faster than it could be replaced.

Some soil conservation methods include planting windbreaks, constructing terraces, and implementing erosion-reducing farming practices. Some of these practices include contour farming, strip-cropping, and no-till farming. Windbreaks, or shelterbelts, are belts of trees that are planted along the edges of fields to reduce wind erosion. When slopes are flattened to reduce run-off, this is know as terrace farming. This is used in the cultivation of rice and other crops from China to the Andes.

The no-till method of soil conservation means that plowing, planting, fertilizing, and weed control are all done at the same time. In other words, once the ground is planted it is not disturbed again until harvest. There is less chance of erosion because the soil is left alone. This method is used in the Southern and Midwestern states. Strip cropping is when farmers alternate a crop that leaves bare ground between rows with a crop that completely covers the ground. Eastern and Central United States are areas that use this method of soil conservation. (Namowitz)

Puerto Rico faces problems with erosion due to the high amount of rainfall and thunderstorms they have each year. The massive amounts of rain cause landslides in mountainous regions and erosion for farmers. Puerto Rico has currently issued laws, which will drastically decrease the amount of soil erosion taking place. For more information look at the US Geological Survey website http://water.usgs.gov/wid/html/pr.html .

Grade Level:
9th grade

Goal:
Our influence on earth has a global impact on the environment.

Key Concepts:
- Erosion
- Soil conservation

Objectives:
1) Students will identify reasons for erosion
2) Students will discuss local and global solutions to erosion problems

Teaching Location:
In the classroom

Lesson Time:
Two 50 minute class periods and students will possibly need to work outside of class

Subject Areas for Infusion:
Science: Earth Science, Environmental Science

Standards:
Science:
C.12.6
A.12.1

Environmental Education:
A.8.1
A.12.1

Materials:

- Water
- Potted Plant
- Clean up materials

Vocabulary
erosion: the removal and transport of materials by natural agents such as wind and running water

topsoil: the portion of soil containing organic material, or humus, that forms from decayed plant and animal material

Set-Up:
Get materials ready by preparing potted plant. Make sure to do the activity outside or have materials ready to put the excess water and soil in. Have clean up materials ready.

Procedure:
Introduction:

Introduce the lesson by giving the students background information on soil erosion, soil erosion in Puerto Rico and the negative effects it has on the environment.

Activity 1. (Demo) about

1) Take a potted plant out of the pot, with soil intact.
2) Discuss how the roots of the plant help to hold the soil in place.
3) Ask what would happen if the plant was not in a pot, but in the ground and water keep running over it.
4) Introduce the term erosion and discuss how wind, water, and ice can cause erosion.
5) Ask students if and where they have ever seen the effects of erosion.
6) Pour water over the soil and discuss what is happening.

Activity 2.

1) Divide class into groups of 3.
2) Have each group brainstorm, on a piece of paper terms that they relate to erosion.
3) After they run out of ideas, have one student from each group go to the board and write 3 of their words. Try not to have repeats.
4) As a class, discuss some of these terms.
5) The teacher then leads the class into constructing a graphic organizer.

Activity 3:

1) In groups have students discuss and note areas of erosion 1. where you live, 2. where you have visited, 3.where you may have heard about on the news.
2) As a class, discuss what conservation means, what topsoil is and list the benefits of conserving soil.
3) Assign the following as homework: Each student is to write a journal entry describing a location near their home that shows evidence of erosion. They should identify what caused this erosion and tell whether or not it is an environmental problem. A labeled rough sketch of the erosion may is also required.

Activity 4:

As a class, discuss other areas of the country and the world that might have erosion problems. Students should be able to use their text to provide some solutions to these problems. After more brainstorming, each group presents 1 reason that soil should be conserved.

Conclusion:

After examining soil erosion, it is important to realize the many ways human activity speeds up the negative effects of erosion. This is a problem that people face across the world, and is therefore important to understand. What can you start to do today? Understand the importance of taking action and being educated on what main industries and factors increase soil erosion.

Assessment:

Once the class is divided into groups, each group will serve as a team. Each team will begin with a total of 10 points. Points are lost when any member of a team misbehaves, does not participate or does not have homework complete. Points are NOT lost for wrong answers. Each day the team with the most points earns extra credit. More than one team can win. In fact, all teams can earn credit if no points are taken away.

References:

Identifying Erosion at http://atozteacherstuff.com/pages/298.shtml

Namowitz, Spalding. McDougal Littell Earth Science, McDougal Littell Inc., Evanston Il 2003. pgs 272-273.

http://www.groundsforchange.com/learn/shadegrown.php?PHPSESSID=78710faac3474b16c7b0067a02e8a762

Hacienda Verde www.haciendaverde.org

US Geological Survey http://water.usgs.gov/wid/html/pr.html