Become an Erosion Expert

Standards of Learning
Science 3.1, 3.6, 3.7, 4.9, 5.7

Objective
Students will:
- Demonstrate how ground cover can slow and prevent soil erosion.

Materials
- Wide mouth jars
- Funnels
- top soil
- grass clumps (including roots and soil)
- water
- watering can
- leaves
- pine needles
- rocks

Background Knowledge
Farmers rely on healthy land to produce healthy and bountiful crops. There are several ways that they can help protect the soil; these are called Best Management Practices (BMPs). A few common BMPs are: conservation tillage, crop rotation, vegetative buffers, and cover crops. First, conservation tillage, which refers to leaving crop residue (the plant material that is left over after harvesting) on the ground. By leaving plant residue on the ground, farmers help prevent runoff and soil erosion. Second, crop rotation, which aids in nutrient management. By rotating complementary crops, such as corn, soybeans, and wheat, farmers can improve the quality of the soil while also reducing the amount of fertilizer needed. Third, vegetative or conservation buffers, which are trees or grasses that are planted in between fields and waterways. These act as a barrier, helping keep pollutants out of the water. Lastly, cover crops, which are planted by farmers in between harvests to prevent runoff and erosion. Cover crops, such as rye grass or clover, protect the soil from wind and water erosion. Additionally, cover crops help keep nutrients in the soil and out of the waterways.

Procedure
1. Define erosion as the breakdown and runoff of soil. Identify ways that erosion can occur. Ask students to brainstorm why erosion can be harmful.
2. Place a funnel at the top of a wide mouth jar. Fill the funnel with top soil. Now use a watering can to “rain” down on the funnel. Have students observe what happens.
3. Note all of the runoff that is now in the bottom of the jar. Tell students that their task, in groups, is to come up with ways to slow down and prevent the runoff. Have available for them to use: soil, grass clumps, leaves, pine needles, and rocks.
4. Have groups take turns demonstrating their findings and conclusions to the class. As a class, evaluate and discuss the success of various approaches. Point out that a common theme is that plant matter slows down the runoff and erosion of the soil. Draw analogies between this and how farmers plant buffer and/or cover crops and utilize no-till.