



LESSON PLAN: Six Ecosystem Functions of Soil (group skits)

Introduction:

Students often do not think of soil as an important resource in the world because they are unaware of what the functions of soil are. Use this lesson to open the eyes of students to the many important ecosystem services that the soil provides us.

Prescribed learning outcomes (PLO) are content standards for the provincial education system; they are the prescribed curriculum. The "Six Ecosystem Functions of Soil" lesson plan will help students to achieve the following BC PLOs¹:

- Earth Science 11 – Surface Processes and the Hydrosphere (F1-F3)
- Geology 12 - Surface Processes and the Hydrosphere (F1, F4)
- Geography 12 – Themes and Skills (A2-A4); Gradational Processes (C1-C3); Weather and Climate (D2, D5-D7); Biomes (E3); Resources and Environmental Sustainability (F1, F2)

Learning Objectives:

- Interpret and identify the six main categories of functions performed by the soil

Materials:

- Cue cards outlining the six ecosystem functions of soil

Activity Description:

To begin, introduce students to the idea that the soil is involved in many parts of Earth's ecosystems, beyond being important for plant growth. Perhaps challenge the class to brainstorm all of the different soil functions that they can think of. Displaying a photo (such as the one in Figure 6) and asking students to identify all of the roles the soil is playing can be a helpful prompt. Then, focus on explanation of the 6 ecosystem functions (outlined below). Emphasize any functions that were omitted during the brainstorming.

¹ Please consult the appropriate Integrated Resource Package (IRP) to identify the PLOs. A catalogue of the BC Curriculum Documents (including IRPs) can be found here: <http://www.bced.gov.bc.ca/irp/all.php?lang=en#>



Photo: Sam Beebe, Ecotrust



Figure 7. A photo of the urban/rural interface; a photo like this can provide a helpful prompt to students to brainstorm the difference functions served by the soil.

Split students into groups, assign them a function (i.e. each group gets a certain cue card with the function outlined on it), and let them plan a short (i.e. 2 minute) skit that represents that ecosystem function in some way. The students then present back to the class. This is an interactive (and entertaining) way to help students see that soil is necessary in a lot of important processes and services in the world.

The 6 Ecosystem Functions of Soil are:

1. Medium for plant growth.

In the soil, plant roots obtain: Physical support to anchor them, air, water, temperature moderation, protection from toxins, nutrients.

2. Regulator of water supply.

Soil affects water supply by storing water for use by plants, or allowing water to seep down into the groundwater. Contaminated water may also be purified as it passes through the soil and removes impurities. Wetlands are a good example of this!

3. Nutrient cycling.

Soil is nature's recycling system. Waste and dead matter are decomposed and their nutrients made available for new life.



4. Habitat for many organisms.

Many living things, from small mammals and reptiles to tiny insects and microorganisms, find their homes in the soil.

5. Atmospheric modification.

Soils breathe! Gases are exchanged between the soil surface and the air. Gases like oxygen and methane are absorbed, while, while gases like carbon dioxide and nitrous oxide are released. The soil provides a valuable carbon sink. The evaporation of soil moisture also affects air temperature and weather patterns.

6. Foundation for construction.

Soil provides building material such as bricks and gravel. It also provides the solid foundation for all our roads and buildings.