Kids Garden News
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Lesson 2: Catching the Rain

Objectives

Students will:

- discover the impact of soil conditions on rainwater absorption
- learn gardening practices to help increase moisture absorption

Standards Addressed: click here

Central Concepts

- Water does not penetrate well in some soil conditions, causing runoff and erosion.

Materials

- 4 old 9" x 13" cake pans (or new foil cake pans)
- garden soil
- compost
- mulch
- fast-growing seeds such as grass, radishes, or beans
- plastic trays
- measuring cups

Discussion Topics

- *What are some things that might affect how much moisture a plant gets from the soil?* (the amount of rain that falls, the amount of moisture that reaches the roots)
- *Might there be a situation where lots of rain falls but doesn't soak into the soil?* (Yes, e.g., compaction, poor structure, not enough plant cover, etc.)

Activity

Rain is a very important source of water for your garden, but sometimes our work in the garden causes conditions that decrease the soil's ability to effectively absorb this life-sustaining element. If your soil is not porous enough, or there are lots of bare patches of exposed soil, rainwater and water from irrigation will simply run off the surface into drains, often causing erosion and taxing the drainage system in the process.

1. To demonstrate these principles, collect four old 9" x 13" cake pans, or purchase recyclable aluminum foil pans. Fill pans with soil from your garden. In the first, mix organic matter such as compost into the soil. In the second pan, plant fast-growing seeds (sow seeds a few weeks ahead of time so plants can become established). In the third pan, cover the soil with a layer of mulch (e.g., shredded bark, straw, grass clippings). Leave the last pan as is to serve as the control.

2. Set the plants on a table and prop up one end to create a slight angle (10 to 20 degrees) with the lower end placed in a plastic tray. Use a watering can to simulate rain on your different "pan landscapes" exposing each pan to the same amount of water at the same rate of delivery.

3. Compare the runoff from each landscape. Lead students in measuring the amount of water collected and documenting the amount of soil lost by erosion. Discuss the implications of the results for their own garden, and how they can apply what they've learned (and compare them to the Gardening Techniques to Try, below).

4. Challenge students to expand on this experiment to test other combinations of landscape variables (e.g., a pan of soil with compost and plants, soil with compost, plants and mulch) or explore using new variables such as different soil types, adding sand or gravel, and propping pans at different angles.

Gardening Techniques to Try
This experiment points out a number of simple gardening practices you can use to increase your soil's ability to absorb and retain water:

- Till compacted soil and mix in organic matter to increase pore space and improve soil structure.
- Cover soil with a layer of mulch
- Try lasagna gardening.
- Install plants with deep and fibrous roots that can take advantage of moisture present throughout the soil.
- Encourage plant growth that covers the soil surface to slow runoff and allow moisture to penetrate. Foliage reduces the force of falling raindrops, reducing soil compaction and erosion.

Extensions

Science: Water absorption is also important in the prevention of stormwater runoff, which can cause soil erosion and pick up pollutants. These substances enter drains and increase the workload of treatment facilities, or they enter and pollute local waterways, causing negative impact to wildlife and groundwater supplies. For background information on stormwater runoff, check out the Minnesota Stormwater Manual.

Ask students to investigate this important issue through Internet and library research. Invite a county or city water treatment employee to talk about local stormwater issues and ways students can help.

One way school gardeners can get involved is by installing a rain garden specifically designed to catch, absorb, and filter pollutants from stormwater runoff. Check out the Rain Gardens of West Michigan for more details and construction information.

Horticulture: Increasing the absorption rate of soil is important, but you can also increase the water supply for your garden and reduce runoff by catching rainwater in a rain barrel. These are designed to catch runoff from roof gutters. Most have screens to exclude organic debris and insects, and spigots for filling watering cans or attaching hoses. You can purchase a rain barrel for your garden or make your own. You'll find instructions for making rain barrels here:

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