

Materials

- 12 hand trowels
- 2 spading shovels, 4 garden forks, 4 garden claws, 2 bow rakes, Warren Hoe, Stirrup Hoe
- Gloves
- Markers and paper
- Wire brush and rags
- *Optional:* vegetable oil for coating

Preparation

- Make sure the soil is dry enough before tilling. Pick up a handful of soil and squeeze it into a ball. It should fall apart when poked.
- Determine where you will be planting peas and clover. Identify one for aerating with hand trowels and the other for aerating with larger garden tools.
- Arrange and label tools.

PROCEDURE

Part 1: Introduce Tools

- As a class, gather in the garden. Arrange students around the chosen tool demonstration area.
- Introduce each garden tool to the group and demonstrate how to use it.
- After all tools have been introduced, explain tool safety rules: (1) use each tool for its intended purpose, (2) keep the working end of the tool below your knees at all times, and (3) always be aware of your surroundings when using garden tools
- Review garden tool names. Call on a few student volunteers to model proper use of selected tools.

Part 2: Aerate Soil for Peas and Clover

- Divide the class into two groups. One group will use the hand trowels to aerate a garden bed. The other will use the larger garden tools to do the same. While aerating the soil, students should also pull out any weeds. Demonstrate how to loosen a weed from the soil and pull it out (roots and all). Gently knock the soil off the roots into the garden bed and place the weed in a tub trug. Pass out gloves.
- *Hand trowels:* Arrange the group around the garden bed so that each student has space to work comfortably. Demonstrate how to use a hand trowel to till the soil. Remove a shovelful of soil and then gently turn it over as if you are flipping pancakes. Pass out hand trowels and have the group get to work. The first group will use hand trowels for the entire rotation.
- *Large tools:* Take the second group to a nearby garden bed, bringing the large tools with you. Arrange students on the long side of the garden bed and explain that they are to work back-and-forth across the garden bed. Use the Garden Claw to demonstrate how this is done. Then, distribute garden tools. As the second group works, have them swap garden tools every 3 minutes.
- After 9 minutes, switch groups. When the second rotation is complete, gather in a common area.

Part 3: Tool Care and Cleaning

- Demonstrate how each tool is properly cleaned after use. First, use your hands to wipe dirt and grime from garden tools. Then, use a wire brush to remove any remaining dirt. Finally, dig the working end of the tool into the sand/oil mixture. At this time, also remind students how to fold gloves (like socks). Have each student clean the tool they are currently using, return it to the lock box, and return their gloves to the bucket. Ask a pair of volunteers to empty the tub trugs full of weeds into the compost bin.

ENGAGE

As a class, gather around a large garden bed. Using a hand trowel, unearth a large handful of soil from a garden bed and display it to the group. "How would you describe its texture? Is it loose and fluffy? Or dense and compacted?" Have students offer adjectives to describe the soil in its current state. Next, grab a large clump of soil and break it up with your hands. Select a few students to do the same. The compacted soil should make this task fairly difficult. "Thankfully, we don't have to rely on our hands to do all the work." Transition to garden tool introduction.

Objectives

- Students will be able to describe the difference between aerated and compacted soil
- Students will understand the basics of safe tool use
- Students will understand how to properly use garden tools to till the soil
- Students will understand how to properly clean and care for garden tools after use

EXPLAIN

Why do we aerate the soil?

After a long winter of being exposed to the elements, and with a little help from gravity, the once-fluffy, life-sustaining soil from last year's growing season will have become dense and compacted. New seedlings have a difficult time growing in compacted garden soil, as tender root systems cannot push their way through the dense soil to access air and water. In order to prepare the soil for planting, gardeners aerate the soil. Aeration is the process of fluffing air back into the soil, making it available to new seedlings. The increased availability of oxygen helps facilitate vigorous seedling growth. Additionally, aeration breaks up large clumps of soil into smaller pieces, improving soil structure. Fine, loose garden soil leads to higher seed germination rates and is more able to support healthy seedling growth over time.

When do we aerate the soil?

Spring planting time has arrived! Finally, time to break out the garden tools and get to work! However, before you get swept away in flurry of garden activity, it's important to make sure that the soil conditions are suitable for aeration. Soil must be dry enough before aerating, otherwise you may be doing more harm than good. To check soil conditions, remove a small handful of soil from a garden bed and squeeze it into a ball. If the ball falls apart when poked, the soil is ready. The soil should feel similar in texture to a wrung-out sponge. If the soil remains in a ball when poked, it is too wet for tilling. Check back in a few days.

ADDITIONAL CONTENT INTEGRATION *(see previous page)*

As a class (or in small groups), assist students in taking soil samples from various areas of the school's campus. Before taking samples, note water drainage and soil cover (mulch, leaf, straw) presence – or lack thereof- and how much foot-traffic the area receives. Then, take the sample and compare with samples from other areas. What do you notice about soil samples from completely mulched areas? Soil from ill-drained areas? Soil in heavy foot traffic areas? Discuss how these factors effect soil compaction and the need for aeration before planting.

Additional Materials

- Auger or shovel
- Glass mason jars (3-4)

EVALUATE

Journal prompt: Draw a picture of each garden tool we used today and label it.