

# THE EDIBLE SCHOOLYARD PROJECT

## THE PRACTICES OF ORGANIC FARMING: CULTIVATION AND TILLAGE

**Summary:** This lesson is a part of a four-part series on the practices of organic farming, which includes soil investigations, composting, and cover crops. In this lesson, students will cultivate or till a garden bed and learn about the role cultivation and tillage play in organic farming systems. Students will also reflect on how cultivation and tillage techniques may vary by scale, and what the costs and benefits of those variations may be.

**Time:** 30-45 minutes

### Teacher Notes:

- This lesson is a part of a four-part series on the practices of organic farming, which includes [soil investigations](#), [composting](#), and [cover crops](#).
- Take some time to read the definitions of the two key terms we will be learning today to familiarize yourself or the class with keywords that will be covered in the lesson.
- The “READ” sections of this lesson plan can be used as talking points or a script to introduce activities. Please note, these sections simply provide brief introductions to the topics. We recommend using your experiences to add more information and context to the topics being covered.
- If teaching asynchronously or assigning the lesson plan as homework, for the sections that instruct students to READ, consider recording yourself reading the sections aloud and sending the recording to students. This adaptation offers a helpful strategy for differentiating learning that supports all students, especially English Language Learners.
- The “THINK or DISCUSS” sections of the activities provide some great prompts for informal conversations. Consider asking your students these questions as they are gardening. You could also create a “question board” with the different questions and have students informally choose different questions to answer while they garden.



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### Teacher Notes Continued:

- Optional—as an added activity you could create a public space where students can share the things they notice during each of the rotations. This could take the form of a board with chart paper and markers where students can write down their answers to the questions labeled “NOTICE.” This extra activity supports students to glean observations from their classmates and learn from one another.
- For more information on the practices of organic farming, see the Center for Agroecology and Sustainable Food Systems curriculum on [Organic Farming and Gardening Skills](#).
- This lesson is part of Edible Schoolyard Project’s [Understanding Organic](#) curriculum and is the sixth lesson in the “core lessons” of the curriculum.

### Materials:

- Garden Fork
- Garden Rake

### References:

Garden Cultivation and Tillage (2015). In Brown, M.; Miles, A. & Perez, J. (Eds.) *Teaching Organic Farming and Gardening* (pp. 31-95). Retrieved from <https://casfs.ucsc.edu/about/publications/Teaching-Organic-Farming/PDF-downloads/1.2-tillage.pdf>

Estimating soil moisture by feel and appearances (n.d). *United States Department of Agriculture*. Retrieved from [https://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs144p2\\_051845.pdf](https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_051845.pdf)

Evaluating soil moisture before field preparation and planting (n.d). *Iowa State University Extension*. Retrieved from <https://crops.extension.iastate.edu/encyclopedia/evaluating-soil-moisture-field-preparation-and-planting>

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## CULTIVATION AND TILLAGE

### Vocabulary:

- **Cultivation:** the process of working the top sections of soil to maintain soil fertility to grow plants.
- **Tillage:** digging deep into the soil to break it up. 4-6 inches is considered shallow tillage while 8-10 inches is deep tillage. Sometimes referred to as deep cultivation .

**READ:** Cultivating and tilling have numerous benefits for gardening, including increasing soil quality by aerating it, breaking up the hard surface in soils, working in nutrients and organic matter, and improving the overall physical characteristics of soil (drainage, texture, etc.).

**DO:** Find an area of the garden that is ready for planting (if you are tilling), or that has been planted (if you are surface cultivating).

**Prepare the Soil:** When you till or cultivate it's important that your soil is moist, but not too wet. *Touch the soil. What do you notice? Is the surface hard? Is the soil wet or moist?* You can check for the amount of water by conducting a hand squeeze test:

- Dig down at least 2 inches.
- Pull up a sample of your soil and squeeze it in your hand to form a ball.
- If the soil has the right amount of moisture, it should form a ball that will fall apart when you bounce the ball in the palm of your hand.

**Cultivate or till:** Now that you checked the moisture of your soil, you are reading to till or cultivate your soil. Follow these steps and as you cultivate take some time to notice.

- Cultivation
  - Use a garden rake or hand trowel to break up the surface of the soil. You should scratch or punch through the surface but not go much deeper.
  - The purpose of cultivation is to break up the surface crust that can block water and oxygen from reaching plant roots. Cultivation can also be used to disrupt small weeds before they grow into larger plants.

- Tillage (sometime called “deep cultivation”)
  - Take your garden fork and dig into the soil the full depth of the fork or 8-10 inches deep. Lift your fork and disperse the soil across the surface. Start from one side of the bed and work towards yourself. Once you have finished the full length of the bed, use a garden rake to even out the soil and break up any remaining clumps in the soil.
  - The purpose of tillage is to break up hard soil, incorporate more oxygen, increase water absorption, and to mix in new soil amendments like compost.

**READ:** For every activity, take the time to notice. What does that mean? Sometimes when we focus on certain tasks, we might not pay close attention to our surroundings. *Noticing* allows us to pay attention to little things, like what the weather is like, or what we observe in the soil. While you work, try to take the time to slow down. You will use the questions from the NOTICE section to help you make those observations.

**NOTICE:** As you garden, think about or discuss your answers to the following questions:

- Feel the soil. What does it feel like? What do you notice about the soil?
- Notice your body. What does it feel like for you to be digging up the soil? Are you physically comfortable or uncomfortable? Why do you think you feel this way?
- What do you notice about the tools you are using? How does it feel for you to be using these tools?
- What thoughts, ideas or memories come up for you as you dig in the soil?

**DISCUSS:** As you garden, discuss these questions:

- We are doing what is called “hand cultivation.” Imagine what this work is like on a larger scale.
  - How do you think farmers cultivate large areas of soil?
  - What might be the similarities and differences between cultivation methods on small areas vs. large areas? Think about tools used, time spent, effort required, environmental impact, the experiences of the person or people doing the work etc.
  - What might be the costs and benefits of these different methods?
  - What do you think are the experiences of people doing the labor of cultivating on large scales? How might they compare to your own? Explain your answer.
- Why do we cultivate? Can you remember what we discussed at the beginning at the activity?