

### Materials

- (4) garden claws, (12) transplanter trowels
- Turnip seed
- (1) 2-liter bottle, cut in half
- Tanglefoot and garden marker for spreading
- Row cover fabric (18') and clothesline clips
- (4) thick gauge wires (approx. 5' length)

### Preparation

- Measure and cut row cover to fit garden bed(s).
- Set aside spading fork and claw cultivator if extra tilling is required.

## PROCEDURE

### Part 1: Aerate Garden Beds

- Divide the class into two groups. One group will use the hand trowels to aerate a garden bed. The other will use the garden claws 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. Also, point out the peas in the bed and the spinach in the other bed. These should not be disturbed.
- *Hand trowels:* Arrange the group around the garden bed (except along the spinach side) 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 gloves and have the group get to work.
- *Large tools:* Take the second group to the other turnip bed, bringing the garden claws 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. As the second group works, have them take turns with the tool every 3 minutes.
- After 9 minutes, switch groups. When the second rotation is complete, collect tools.

### Part 2: Direct Seed Turnips

- Use the Warren hoe to create a shallow furrow running the length of each of the two beds, about  $\frac{1}{2}$ " deep.
- Starting at one end of the bed, place approx. 3 turnip seeds in the furrow, spaced about 2in apart. Students will use this spacing as their guide. Distribute 3 turnip seeds per student. Starting at one end of the row, have students take turns placing their seeds in the furrow—the next student begins planting where the last student left off.
- Lightly cover seeds with  $\frac{1}{4}$ in of soil. Here's the rule for planting depth: take the diameter of a seed and plant twice that deep. Gently pat soil down and water well.

### Part 3: Install Row Cover

- Select two students to spread a thin layer of Tanglefoot outside each half of the 2-liter bottle. Place traps at opposite ends of the pea garden bed, with the Tanglefoot-coated surface facing out.
- Starting at one end of the garden bed, demonstrate how to install wire supports. Insert one end of the wire into the garden soil at the edge of the bed, pushing it into the soil until secure. Stretch the wire to the other side and repeat the process. The wire should stand upright, forming a large hoop over the garden bed.
- Install wire hoops 3-feet apart along the garden bed. Select a student pair to install each hoop. When finished, drape the row cover over the hoop and select students to fasten the fabric to the base of each hoop with clothesline clips. Collect remaining materials and return to the gathering space for discussion.

### ENGAGE

“Plants are picky. Some prefer full sun, while some thrive in the shade. Some plants love hot summer temps, while others do best under cooler conditions. Just as different garden crops prefer different growing environments, different types of seeds require certain conditions in order to germinate. On this note, it’s very important to know the proper planting depth of a given seed before planting. Some seeds must be planted deeply, while others can germinate under a shallow covering of soil. Some seeds, like turnips, require little to no soil cover in order to germinate and can be broadcast over the bed.”

### Objectives

- Students will understand how physical barrier methods help to deter garden pests
- Students will understand how other organic methods of pest control work, such as installing Tanglefoot traps

### EXPLAIN

#### Barrier Methods for Keeping Pests Away

Tender turnip seedlings are prone to attack by flea beetles. Larvae feed on the roots of the plant, while adults snack on the stem and foliage. Establishing a physical barrier around plants is the first step in deterring these tenacious garden pests. We can protect turnips seedlings from attack by constructing a row cover around plants. Thick-gauge wire is used to form large hoops, which support a light cover of remay fabric over top. The remay fabric is then securely fastened at the base of the hoops, cutting off access to garden bed. The remay barrier keeps pests away, but allows sunlight and a moderate amount of water to pass through. Heavier waterings, however, may require you to briefly remove the remay fabric in order to expose the soil.

Forming a barrier around plants is a widely used form of organic pest management. Physical barriers serve as an effective and chemical-free form of pest control in gardens with minor pest problems. However, some determined garden pests might still manage to find a way through a securely constructed row cover. In this case, it’s always good to have back up. In this lesson, we use a special substance called Tanglefoot to attract any rogue flea beetles that have found their way into the protected garden bed. Tanglefoot is applied to the inside of a plastic bottle and placed in a strategic location inside the row cover. Tanglefoot attracts the curious beetles, which enter the bottle to explore its contents and consequently become stuck to the sticky bait. We can revisit the Tanglefoot traps every few days to check for trapped beetles. If present, flea beetles should be removed and discarded of and a new coating of Tanglefoot should be applied.

### ADDITIONAL CONTENT INTEGRATION *(see previous page)*

Prepare “Seed ID” cards. First, cut paper stock into 4X6-inch cards. Label the cards with the corresponding seed name and use glue to firmly attach seeds. Let dry. During the lesson, pass around the ID cards to introduce the turnip seeds.

#### Additional Materials

- Paper stock
- Scissors and glue
- Spare turnip seeds
- Markers

### EVALUATE

**Journal prompt:** Revisit the Tanglefoot traps during your next garden session. Have they attracted any flea beetles? If so, how many?