Preparing to Transplant

Edible Schoolyard Pittsburgh

GROW PITTSBURGH

Spring
Mid May

MATERIALS

- Chart paper and marker
- Tray of seedlings to be transplanted the following week
- 5 gallon bucket
- 1T Unsulfured molasses
- Aerator, Tubing, and Stone

PREPARATION

- Make sure there is a heaping spade-full of compost in the bin.
- Fill a 5 gallon bucket half full with tap water. Run the aerator, bubbling air into the water for at least an hour to evaporate the chlorine.

PROCEDURE

Part 1: Harden Off Seedlings

- Draw two columns on a piece of flip chart paper: *indoor conditions vs. outdoor conditions*. As a class, record words that describe the differences. Then, go back and circle those words under each heading that could affect the life of a plant. Add more words as needed. Be sure to consider wind, water supply, light intensity, and temperature change. Define *harden off* and explain that seedlings need time to adjust to their new homes outdoors.
- As a class, find a location in the garden or around the outside of the school that will provide shade between about 11am and 3pm and that is exposed to occasional breezes. (High traffic areas or spots close to the playground are not ideal.) “Over the next week we will still water them, but only after the top of the soil has dried out (about every other day with a watering can). Also, we will keep an eye on the forecast and bring them indoors if the temperature is going to dip below 40° F or if heavy wind or rain is expected.” (Bringing the seedlings in over the weekend is recommended.)

Part 2: Make Compost Tea

- “We are going to use finished compost to make a potent compost tea for our transplants. The nutrient-packed tea will give these tender transplants a powerful boost of energy as they transition to life in the great outdoors.” Select five to ten students to each place a large handful of compost into a 5 gallon bucket. Bring the bucket back to the classroom.
- In the classroom, gather around the bucket half-full of water with the aerator bubbling air into it. *We have been letting this water bubble in order to evaporate the chlorine that is in our tap water. Chlorine is added at the water treatment plant to kill micro-organisms that could make us sick when we drink the water. We are not going to drink this compost tea, though. In fact, we want the micro-organisms in our compost to thrive. That’s why we evaporated the chlorine.* Add 1T unsulfured molasses to the water and explain that the sugar will provide a food source for the beneficial micro-organisms in the compost.
- Next, dump the compost brought in from the garden into the bubbling sugar-water. *Our compost tea can brew for 2 to 7 days. We’ll keep the bubbler running to add oxygen to the mix. This will keep the micro-organisms alive and will prevent anaerobic decomposition (which would make the tea smell like a swamp).* Stir the mixture every day to keep it active.
- When it comes time to use the tea, you will place the paint strainer on an empty 5 gallon bucket and pour the mixture through the strainer. Use the liquid immediately. The beneficial micro-organisms will begin to die without air. The compost solids can be used for transplanting, too, or added back to the compost bin.

Too Much of a Good Thing

Food & Technology

OBJECTIVES

- Adaptation to environment
- Too much of a good thing is a bad thing

ENGAGE

Have small groups of students create a list of three things that are good for us in smaller doses but harmful in larger amounts. To stimulate thinking, ask, *What do you think might happen if you breathed twice as much air, ate 12 meals a day, or played basketball for 12 hours straight?* Have a representative from each group share their lists.

EXPLAIN

Hardening Off

Just as athletes train for the big event, developing seedlings must go through their own training regimen in order to successfully survive outdoors. In the week prior to transplanting, we begin to gradually increase seedlings' exposure to the elements. This process is referred to as "hardening off". During this process, plants go through significant changes. The waxy cuticle that covers their leaves thickens to slow water loss. The walls of cells inside the plant become thicker in order to help it stand up to wind and raindrops. The chloroplasts inside the cells rearrange themselves so they don't get an overdose of sunlight. And the plant will grow at a different rate as the temperature changes. After the plant has grown a bit in the garden, you will notice that the new leaves look much healthier and are a different shape (not as broad).

Compost Tea vs. Fertilizer

Even when hardening off, seedlings will experience some shock upon being transplanted into the garden. Most of their lives was spent adapting to a mild environment, and we are transplanting them to a harsh environment. To ease the transition, we give plants a boost of fertilizer. Compost tea is a living, organic fertilizer and provides nutrients to the plant at an even rate. Synthetic fertilizers such as Miracle Grow work, but they themselves provide a sudden shock to the plant. Imagine what it would be like to chug a gallon of water after sprinting a mile.

A nitrogen-heavy fertilizer, be it compost tea or a synthetic product, should not be used regularly on garden plants. Plants respond by growing rapidly and creating lush foliage. This makes the plant more susceptible to diseases and pests (especially aphids). In addition, the plant gets so caught up with making leaves that it forgets to make flowers and fruit!

ADDITIONAL CONTENT INTEGRATION *(see previous page)*

Part 1: Select a few seedlings (about ¼ of the total) to keep indoors and care for as normal. Transplant these seedlings into the garden at the same time as the others and clearly label them. During their first week in the ground, compare the health and growth of both sets of seedlings.
Part 2: Make a small batch of compost tea in a separate container. Instead of aerating this batch, screw on the lid. Compare the two batches after a week.

ADDITIONAL MATERIALS

- Small container with screw-on lid
- Bread and Jam for Frances

EVALUATE

Journal prompt: Define hardening off. Why is it important to harden off seedlings?