



## Supplemental Activity: Fast Plants

In this activity, your students will grow "Fast Plants" or other mustard family plants to observe the plant life cycle from germination to seed production. Don't worry about measuring the size of the plant or getting involved in complex genetic experiments. Instead, pay close attention to its life stages, especially seed production. Students can record observations with drawings and descriptive writing in journals. Note the aspects of the plant's life cycle that are common to all flowering plants.

### Learning Goals

#### *Big Idea 2: Life Cycle*

- The student will be able to describe the steps of the plant life cycle: seed, seedling, growing plant, flower, pollination, seedpod, seed dispersal.

### Materials

- Fast Plant seeds
- soil
- flowerpots (plastic six-packs)
- felt and plastic bins (for wick-watering system)
- lighting system for 24hr/day light
- links:
  - <http://www.fastplants.org/activities.php>
  - "GrowLab Activities for Growing Minds" (at <http://www.gardeningwithkids.org/10-4008.html>) is an excellent resource with many activities that go beyond the scope of this project

### Procedure

#### 1. Estimated time

This activity should be spread over about 7 weeks and may require an hour or so of observation and writing each week.

#### 2. Introduce the activity (Engage)

Begin by building on students' prior knowledge of plants. Ask them:

- Have you grown plants from seed? Describe what you did and how they changed as they grew.
- What are the stages in a plant's life?
- What are the parts of a plant?
- What do plants need to live?

### 3. Planting the seeds (Explore)

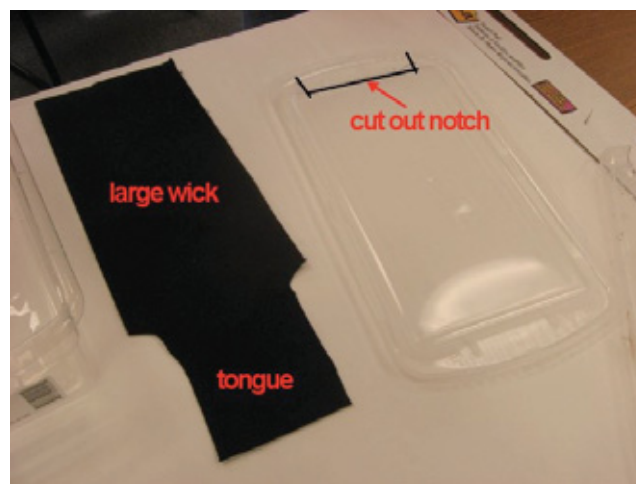
Decide whether each student or student team will have their own plants, or if the whole class will share all the plants. One way to compare stages in the life cycle is to start a new set of seeds (say, one six-pack) every week. The whole class could observe the same series of plants, or each team could have one six-pack and plant a new cell each week for six weeks.

For another good set of instructions, see <http://www.fastplants.org/activities.php>

- Add 1 inch of water to the watering bin (the plastic shoebox).

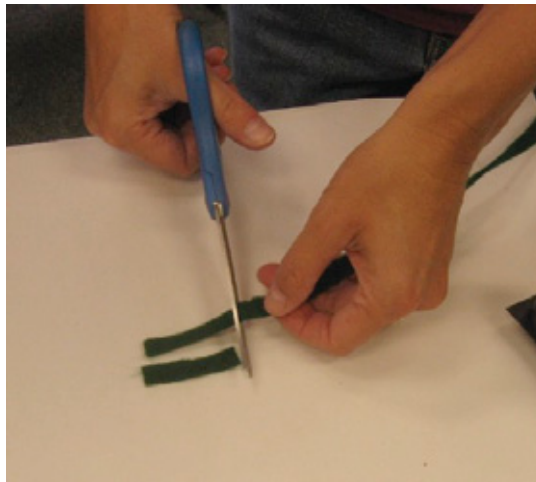


- Place the large wick on the bin top with its “tongue” hanging down, and put the top on the bin so that the tongue reaches into the water.

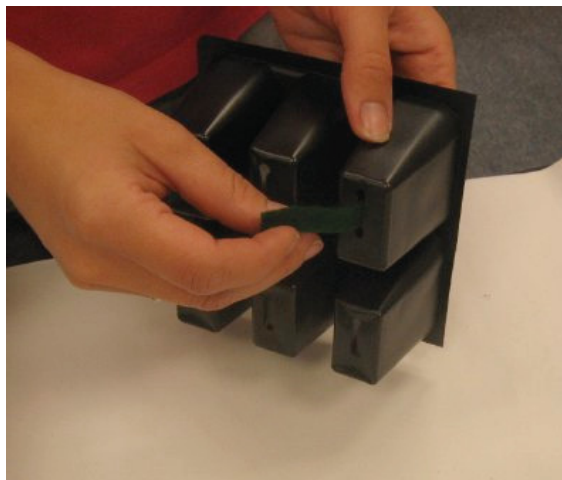




- From the green felt, cut a small wick about 1/2 inch wide and about 1 1/2 inches long. One wick is needed for each planting cell, or six wicks per 6-pack.



- Push a felt wick halfway through the hole in each plastic cell of the six-pack.



- Dampen the soil by placing some of it in a large bowl, adding some water, and mixing.
- Fill the six-pack pots with soil. Press the soil down. Leave about 1/2 inch space at the top.



- Make 2-3 small dents in the soil with the eraser end of a pencil. It should be only as deep as the eraser.
- Place one Fast Plant seed in each hole.
- Push a little bit of soil into the hole to cover the seed. Pat it down.
- Place the six-pack on the large wick. Two six-packs fit on top of each shoebox.
- Label the cell or the six-pack with the date and other information (e.g., student name or group). A piece of a plastic yogurt container makes an excellent label.



- The plants can be thinned to one plant per cell after the cotyledons form, or left alone.

- Place the trays under the grow-light assembly. Note: five trays will fit under each of the two lights with two six-packs on each tray. So the setup can light 120 cells!



- If you are using grow lights, keep the lights within 5-10 cm of the plants as they grow. Note: Leave the lights on all the time. (Attach a note to your setup, asking that the lights remain on!)
- Make sure the large felt wick stays wet and the soil feels moist.

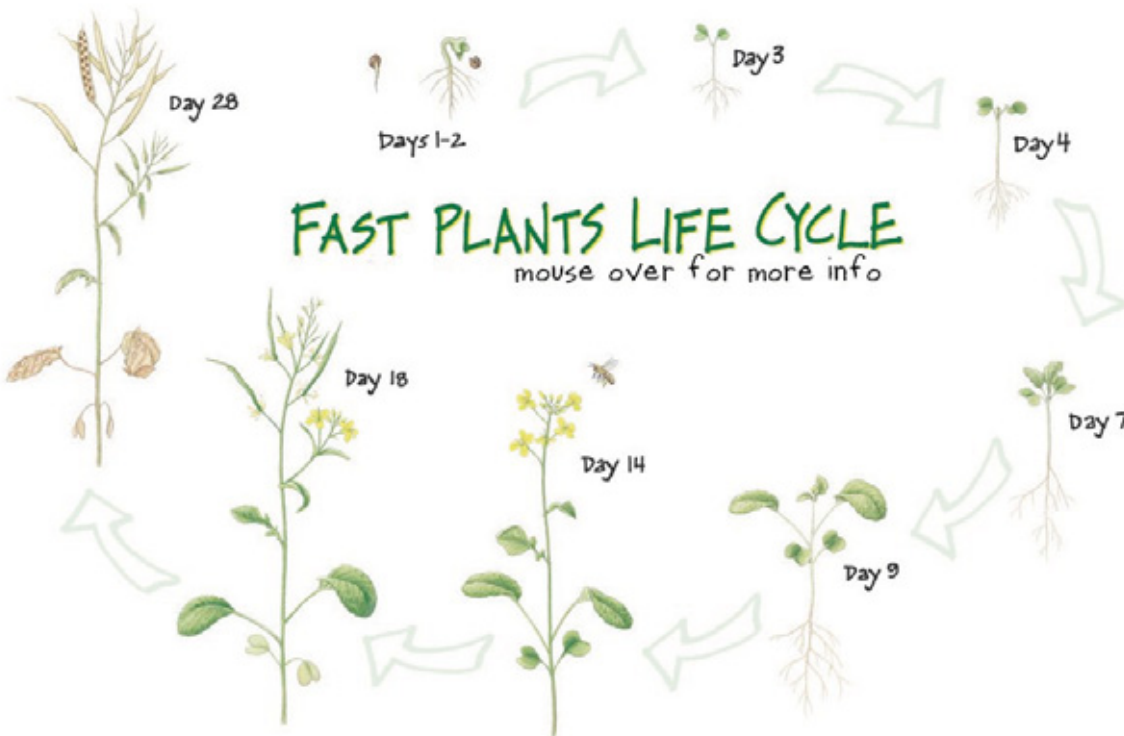
Tip: One way to compare stages directly is to start a new set of seeds every week.

### **Observations**

You may wish to tailor students' observation schedule around new features as they appear. For each new feature, students can record observations by drawing and writing. They should record the date and number of days from planting. If they use a journal, they can compare what they see with the last observation and have a complete series at the end of the project. Be sure to discuss what function each new feature serves for the plant.

A very nice website which summarizes the life cycle stages of a fast plant is

<http://www.fastplants.org/intro.lifecycle.php>



Here is a rough schedule:

- Day 1-2: Seed opens and starts roots.
- Day 2-4: Two cotyledons (seed leaves) emerge.
- Day 7: True leaves form.
- Day 9: Flower buds are visible.
- Day 10-12: Stem gets longer and flower buds rise above the leaves.
- Day 13-17: Flower buds open. Identify the floral parts. Pollination takes place.
- Day 18-22: Petals drop from the pollinated flowers. Pods start to form.
- Day 23-36: Seeds ripen. Lower leaves dry and turn yellow.
- Day 36: Plants may be removed from water and pods allowed to dry.

After the pods have dried, students should harvest the seeds. If there is time, they can plant those seeds and start a new cycle.

A final step, not mentioned in many workbooks, is to examine the roots. Have students gently free the soil from the tiny root hairs. Have them draw the root structure and explain its function.

## ***Wrap-up***

Have students review their observations and make a presentation of the entire life cycle. Have them think about which features are inherited (e.g., flowers are yellow) and which features are acquired or developmental (e.g., plant is floppy or “leggy,” leaves turn brown). With some features, this distinction may not be clear. For instance, both genetics and environment affect how tall a plant will grow.

As an extension activity, have each student investigate other plants, either houseplants or outdoors, that look very different, but have the same parts. Have them bring in samples and compare different leaves, seeds, flowers or stems.