Dueling Greens

Objective: Students will observe the different rates of growth when competing plants are present.

Summary: Students will grow a plot of grass and a plot mixed with grass and radishes and compare the rate of growth.

Time: 1½ hours over three weeks

Student Grouping: Groups of four to six

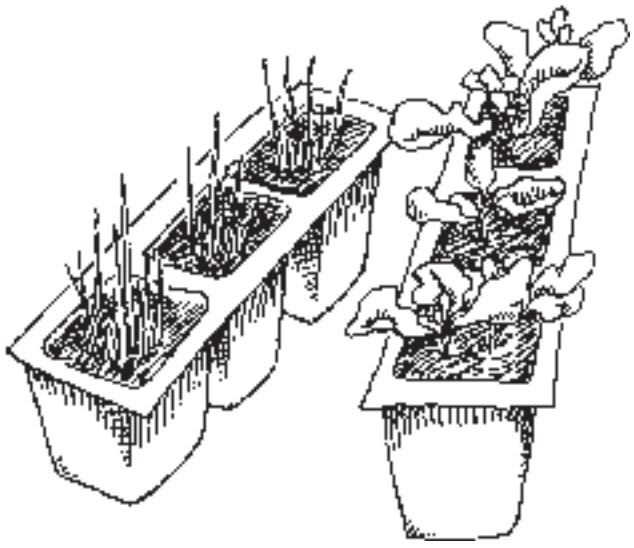
Materials: Per group: One plastic seedling tray, ¼ cup grass seed, ⅕ package radish seed, a watering can, 1–2 lbs. potting mix (soil), one plastic bag.

Background Information: Plants compete for the things they need for growth. That is why farmers remove weeds from their fields. They want all the space, nutrients, water, sunlight and oxygen in the area to contribute to their crop's growth, not to weeds. If weeds are allowed to grow, they often shade the desired plant, restricting the amount of sunlight it has for photosynthesis.

In this activity, radishes, which have broad leaves, are planted with grass. The broad leaves of the radish will shade the grass. In the soil the radish seedlings will be using nutrients that would otherwise be available to the grass. The two plants compete for their growth needs.

There are times when weeds can help a garden. For instance, an insect called a lacewing eats aphids, a common garden pest. The larvae of the lacewing likes to live on dandelions, a common weed. So this weed can feed an insect that helps the garden. There are also weeds that can add nutrients to the soil, as well as ones that help aerate the soil with strong, deep roots.

Marin Ag. Facts: Both plants and animals experience competition for space, water and soil. In Marin County there are people who "compete" to use open space in different ways. In a sense they are competing for the land in the county. Through the planning process, community priorities have been set to preserve open space, at the expense of some development. The county's policies make it affordable for a farmer to keep farming his or her land rather than feeling the competition, pressure to develop homes or commercial buildings. While this does not always pay top dollar per acre over the short term, it does allow a lifestyle to exist where it would otherwise surely perish. The agriculture in Marin could be quickly overshadowed by a different form of economic development.



Preparation:

1. Gather materials. The seedling trays (see illustration) can be obtained from a nursery. Gardeners often get them when they buy plants. Any shallow (3") tray with drainage will do, including a foil pan with holes poked in the bottom. Potting soil is weed free, eliminating other competing plants. A spray bottle will allow students to keep soil moist without washing away the seeds. As seeds sprout, plastic bags can be laid over the soil to keep moisture in over a long or hot weekend.
2. Review the procedure so you understand the process. Each group will be planting two equal-sized plots. (Seedling trays are split down the middle, making this easy.) One plot will be just grass, the other will be grass and radishes.
3. Decide how you will group students. Where will the trays receive enough sunlight for growth? They will grow with limited sunlight but will take longer.

Procedure:

1. Lead a class discussion about space competition. Ask students: How much room do you need to live? If you lived in a tiny place with lots of other people, would it be harder to grow? Do you think plants need room to grow? We are going to plant some grass in one container and grow grass with radishes in another. Do you think they will grow differently? Record all predictions.
2. Instruct students to collect a tray and seeds. Have them fill their trays loosely with soil.
3. Have students plant the whole tray with grass seed by sprinkling seed evenly over the entire tray.
4. Next have them plant their radish seeds in only one half of the tray, once again sprinkling them over the soil. Have them lightly stir the top of the soil by dragging a pencil lightly over the surface. This mixes the seed into just the top bit of soil.
5. Next pat the soil down flat. Water carefully. Don't use a heavy stream or the seeds will be disturbed.
6. Keep the soil moist. If there is a possibility that the seeds might dry out over the weekend, be sure to water late on Friday and cover the tray with plastic to hold in moisture.
7. Make notes twice a week on plant growth.

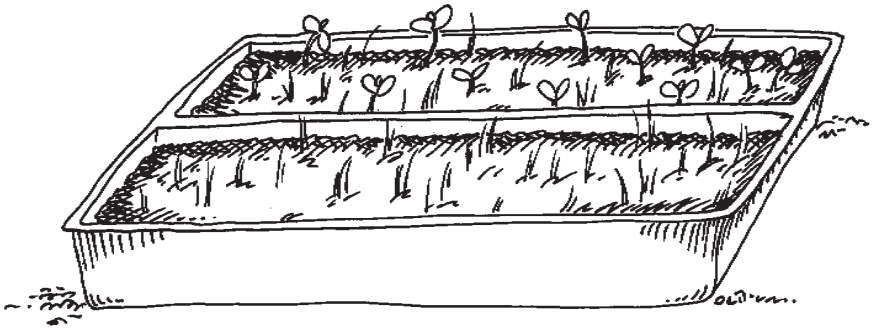
Questions for Discussion:

- These are the predictions made the day we planted the seeds. Did they happen?
- What is the difference between the two plots?
- Why do you think there is a difference?
- What were we testing in this experiment?
- Are there differences in the plants' roots?

Extensions:

- Use these plots for the Run-off Race activity, on page 111.
- Plant outdoor plots and weed one but not the other. Keep notes on the differences in leaf, root and stem size, productivity, insect inhabitants and any other notable differences.
- Have a farmer or gardener come talk to the class about plant competition and "companion planting." (Companion planting means that some plants help each other when planted together.)

Dueling Greens Handout



WEEK ONE

Date_____

Radish & Grass Tray	Grass Only Tray
Tallest grass _____	Tallest grass _____
Shortest grass_____	Shortest grass_____

Observations: _____

_____

_____

Date_____

Radish & Grass Tray	Grass Only Tray
Tallest grass _____	Tallest grass _____
Shortest grass_____	Shortest grass_____

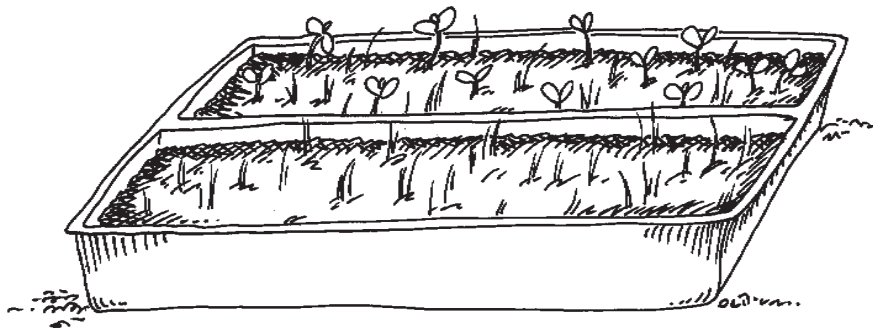
Observations: _____

_____

_____

Repeat for WEEKS TWO & THREE

Competencia entre el rábano y el pasto



SEMANA #1

Fecha _____

Bandeja de rábano y pasto (zacate)	Bandeja de solo pasto (zacate)
El pasto más alto _____	El pasto más alto _____
El pasto más bajo _____	El pasto más bajo_____

Observaciones: _____

_____

_____

Fecha _____

Bandeja de rábano y pasto (zacate)	Bandeja de solo pasto (zacate)
El pasto más alto _____	El pasto más alto _____
El pasto más bajo _____	El pasto más bajo_____

Observaciones: _____

_____

_____

Repite la documentación de tus observaciones para las SEMANAS #2 y #3.