Upper Valley Farm to School Network
Community Curriculum Pilot Project
May 2012- The Zucchini Challenge

Overview:

In this unit, students will learn what a plant needs to survive (soil/nutrients, space, oxygen, sun, and water), and will consider why plants might not survive (a lack of any of the things it needs as well as other risks such as disease and predation). They will estimate the number of seeds in a zucchini, and discuss why a plant might produce a lot of seeds. Students will plant their own zucchini seeds, and will learn how to care for their plant and how to use its fruit.

Standards addressed:

VT Standard 7.13: The Living World: Organisms, Evolution, Interdependence: Students understand differences among living organisms, understand the role of evolution, and recognize the interdependence of all systems that support life. This is evident when students:

a. Identify characteristics of organisms (e.g., needs, environments that meet them; structures, especially senses; variation and behaviors, inherited and learned)

VT Standard 7.9: Statistics and Probability Concepts: Students use statistics and probability concepts. This is evident when students:

a. Collect, order, display and analyze data in order to answer a question or test a hypothesis.

VT Standard 7.10: Mathematical Problem Solving and Reasoning: Applications: Students use concrete formal, and informal strategies to solve mathematical problems, apply the process of mathematical modeling, and extend and generalize mathematical concepts. Students apply mathematics as they solve scientific and technological problems or work with technological systems. This is evident when students:

a. Solve problems by reasoning mathematically with concepts and skills expected in these grades.
f. Make sensible, reasonable estimates.

Focusing Question:

What does a seed need to grow? Why do plants produce a lot of seeds?

Preparation:

Be prepared to spend about 30 minutes gathering materials. If you are making the pots to start the zucchini plants in for the students, add an additional 30-40 minutes.

Materials:

Full-grown zucchini fruit to look at and dissect
Knife for slicing the zucchini
Paper plate or paper towel for each student to count seeds on
White board, chalkboard, chart paper or Smartboard for recording seeds counted and estimating total number of seeds
Cards representing negative and positive growth conditions
Boombox/instrument/ipod and speakers to play music (optional)
Paper, rocks, flags or cones to serve as bases during game
2-3 zucchini seeds per student
Potting/starter soil
Water to mix into potting soil – you can do this in advance or with students
Pots – you can use empty milk cartons, make pots out of newspaper, or find or buy peat pots or plastic pots
Blanket/sheet/table cloth to put under planting station to catch dropped soil, if working inside
Examples of soil that's too wet and soil that's too dry (optional)
Copies of take home information, plant journal materials and plant growth chart for each student

Procedure:

Introduction (2 min): Introduce yourself. "Today we'll be learning about zucchini seeds! We'll find out about how many seeds are in a zucchini, play a game to learn about what a zucchini seed needs to grow, and plant our own zucchini seeds!"

Counting zucchini seeds (15 minutes): Show students the whole zucchini to remind them what it is. With younger students, discuss the difference between a zucchini and a cucumber. Slice the zucchini into rounds, and give each student at least one slice on a paper towel or paper plate. Ask the students to count how many seeds there are in their slice. Have each student share the number of seeds s/he counted. Record these numbers where all students can see them. Help students figure out approximately how many seeds total are in the zucchini. Discuss estimation as a math strategy, and as a class, estimate how many seeds there are. With younger kids, you will have to do a lot of the math, but with 2nd, 3rd and 4th graders, students will be able to solve the problem, and could even do so individually and then share their strategies and answers with the class. You can mention that each zucchini plant has many fruits, and do

Enacting the risky life of a seed (15 minutes): Ask, "Why does the zucchini plant make so many seeds?" Guide students to discussion about the risks a seed and a plant face (drought, predation, disease), and their needs (water, sunlight, space, air, soil/nutrients).

"We're going to enact the risky life of a seed!" Pass out cards to the students, and explain that some students are seeds and the rest are positive or negative growth conditions. Explain that they should look at their card but keep the information on it a secret at first. In a large indoor or outdoor space, set up bases spaced at least five paces apart. Explain to the students that when you say "go" they

should run around the bases in a circle. When you say "Stop!" they should run to the nearest base. If you brought music, the cues to start and stop running can be starting and stopping the music.

Ask the seed to reveal where it has landed. Ask the other students to reveal the conditions on their card. Have the students determine whether or not the seed is able to survive and grow in this spot. Check the conditions on the other bases to see if the seed could have possibly germinated.

Planting seeds (15 minutes): "We are going to start zucchini seeds for you to take home and find a place to plant. You will need to take good care of your plant inside before planting it outside. When you find a place for your plant, think about all the things that plants need to grow best." Demonstrate planting, showing students to
water the soil until it is damp to the touch, but not muddy, that the soil should be tamped down, but not packed tight, and that the seeds should go to a depth of 2 times the size of the seed (students can measure this on their finger and then make the hole with their finger, pushing down until they get to the spot they found on their finger that was twice the size of the seed). Each student will get a chance to plant 3 seeds. Prepare a station for planting, while other students may create newspaper pots, draw/color pictures of zucchini seeds or plants, record in their plant journals, or read through their take home materials. When all students have planted, review with the class what their plants will need to grow and also review what information they're taking home.

Closing (3 minutes): Ask, "What does a seed need to grow?" or "What are you excited to make with your zucchini when it's ready?" or "What did you learn?"

Extension ideas:

- Expand the math component of the lesson by making a chart comparing the seeds in each slice, or counting the seeds in two different zucchinis and comparing those numbers.
- "Soil Recipe" activity (attached)
- Teach the students a song about planting or seeds

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The first half of the lesson was adapted from Shelburne Farms' "Tomato Planet" activity, found on pages 27-28 of Shelburne Farms Project Seasons: Hands-On Activities for Discovering the Wonders of the World by Deborah Parrella, published by Shelburne Farms in 1995.

The plant journal materials and plant growth chart are from the Food Works at Two Rivers Center's Gardens for Learning 2009 Resource Guide.

The extension idea of the "Soil Recipe" activity is from pages 59-60 of Shelburne Farms Project Seasons: Hands-On Activities for Discovering the Wonders of the World by Deborah Parrella, published by Shelburne Farms in 1995.

Appendices:

- Cards representing negative and positive growth conditions
- Handout on plant care and zucchini recipes for students to take home
- Plant journal materials (2 page handout)
- Plant growth chart
- "Tomato Planet" activity
- "Soil Recipe" activity