

**Slow Food Denver
Seed-to-Table School Garden**

**Program and
Lesson Plans**

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Mission:

Slow Food Denver Seed-to-Table Program creates meaningful relationships between young people and food. By placing an emphasis on hands-on experiences, community interaction, and the pleasures of the table, SFDSTT projects help to strengthen the food communities of tomorrow by engaging youth today.

We work closely with Denver area schools to teach students where their food comes from, who grows it, how to prepare it, and the importance of sharing it with friends and family.

Educational Goals of Garden Programming

- Providing an environment for experiential scientific inquiry and observation
- Making interdisciplinary connections
- Encouraging critical thinking
- Locating students in a concrete place



General Lesson Planning Guidelines

All lesson plans should follow a common structure in order for the students to anticipate what is coming and behave appropriately. Each group of lessons (centered around a season or theme) should have a similar structure to individual lesson plans. The following elements should be present in each theme as well as each class.

Lesson Groups Should Include:

1. Context:

- Where are we?
- What are we doing?
- Why are we doing it?

2. Activities

- Action and/or Observation

3. Wrap Up

- What did you notice?
- What did you like?
- Why is it important?

Sample Individual Lesson Plan

15 minutes	Story or book (setting context) Read a book or give the context of the lesson. Use lots of pictures or draw on the board
15-30 minutes	Investigation/snack Do a hands-on activity combining food with the gardening. For Example: examine and eat types of seeds when planting seeds. Or prepare some herb tea before planting herbs
5 minutes	Instructions-Use quick, very precise instructions about what to do. Make sure there are more than one station and it is well organized.
25-40 minutes	Activity. Do the activity. Have one adult in charge per group. Keep students in groups smaller than 8, if possible. Make sure students have back up activity like drawing in journals if they complete the task early.
10 minutes	Wrap up. Ask questions like: What was your favorite part? Name one new thing that you learned. What did you like to eat and why? Have you tried it before? Has anyone in your family grown this before?

Note, if you have more time, the wrap up can be a demonstration of their knowledge. For example they can design seed packets describing what seeds need to grow.



Garden Themes Throughout the Year

Spring Garden Classes

1. **Where Are We?**
2. **Soil**
3. **Seeds**
4. **Transplanting**
5. **Planting**

Summer Classes

1. **Botany on Your Plate**
2. **Food and Culture**
3. **Bugs**

Fall Classes

1. **Youth Farmers Markets**
2. **Harvest/Tasting**
3. **Seeds**
4. **Life Cycles**
5. **Compost**



Lesson 1: Where Are We?

Objective: Introduction to garden classes and garden

Students will have a sense of where their school is located within the Denver area, where the natural water is and where the garden is located.

Activity 1:

Create Garden journal. While they are putting their name on their journal, talk about what you will be doing throughout the year in the garden program.

Activity 2: Discussion of Garden safety rules

Slow Food Garden Rules

- No running in the garden
- No children under aged 10 will be allowed to use long handled tools (shovels, hoes, rakes).
- Children will be encouraged to use their hands (as opposed to tools) as much as possible when gardening.
- Children will be provided with gardening gloves if exposed to thorns or other dangerous plant material.
- Shoes must be worn at all times.
- All participants will be instructed as to proper handling of tools, including no running and carry tools face downward at their side.
- Children must be supervised when gardening
- Participants who do not follow safety rules will not engage in gardening.

Food safety issues:

- No use of chemical fertilizers or pesticides in the vegetable garden
- No use of raw manure as fertilizer
- Soil testing will be done each year for lead (as part of science education)
- All produce will be washed before being eaten or sold.
- All participants will wash hands, using proper handwashing techniques, after being in the garden.



Activity 3: Where are we?

1. Divide the students into groups of 5-8. Have each group explore one quadrant of the school grounds and make a sketch of what they find.
2. Return to the classroom and have each group draw their part of the school on a large piece of paper, such as a piece of butcher paper.

Questions to answer:

- Where is the School with in Denver?
- Where are the mountains?
- Which way is north?
- How does the sun hit the garden? When is it sunny or shady?
- What season is it? What is growing outside? What is available to eat?

Materials Needed

Journals

Pens

Butcher paper

Large felt pens

Map of Denver with waterways marked

Map of Colorado

Activity 4:

Seasonal Snack-Assemble a snack from ingredients that might be available in season

Wrap Up and Discussion

Lesson 2: What's in My Dirt?

Activity 1: Yogurt Fruit Parfait Snack

Objective: To demonstrate the idea that soil has different layers and to provide a nutritious snack

Yogurt Fruit Parfait

Vanilla Yogurt
Granola
Almonds (check for allergies)
Strawberries
Bananas
Berries
Blueberries

Cut up all of the fruit. Let the students make layers of yogurt, granola and fruit in a cup.

Afterwards:

Pass out copy of food pyramid.
What food groups are in a yogurt parfait?

Activity 2: Soil Composition

Objective: To explore the attributes of different types of soil

Collect 4 soil samples (about 5 cups of each soil) from diverse areas such as:

Soil from a well-established garden
Soil from a parking lot or other unimproved area (heavy clay)
Some compost, if available
Soil from your school garden

Take 1 cup from each type of soil and put it in a mason jar. Fill the jar with water and shake it up vigorously. Place all of the jars in the classroom at least 2 days before the soil class to let them settle. You will use them at the end of class so that the students can see the different layers of soil.



Divide the class into 4 groups, with one volunteer per group

1. Talk about soil composition using the “What’s in My Dirt?” handout.
2. Each group should have 4 samples on their table, each numbered.
3. Each group should have a sheet to record their observations. They should note:
4. color, texture, smell, how sticky, etc.
5. Talk about differences. Tell the students which sample came from which places.
6. Use the Soil Layer diagram to observe the jars. Which ones have the most clay? Which have the most humus.
7. Keep some of your garden soil and send it to the lab for lead and nutrient testing. Share the results with the students during the next class.

You need to send a ziplock sandwich sized bag of soil and \$15.00 to:

CU Extension

Soil and Crop Sciences Department

Colorado State University

Fort Collins, Colorado

(970) 491-5061(office)

(970) 491-2930(fax)

www.extsoilcrop.colostate.edu/soillab/soillab.html

Jim Self, PhD

jimself@lamar.colostate.edu

Activity 3: Test the nutrient content of your soil (NPK) and Ph

There are really easy tests for kids to use:

Rapitest Soil Test Kit

http://www.amazon.com/Rapitest-Soil-Test-Kit/dp/B0002KPKXU/ref=pd_sim_k_

Wrap Up and Discussion



What's in My Dirt?

Clay

Sticky, heavy. You can roll it into balls. Clay soil does not absorb water easily. But, when it is wet, it stays wet. Sometimes plants cannot get enough air and water in clay soils. But it does have more nutrients

Silt

Soft and silky. Very fine particles, but does not stick together. It does not absorb water well. The particles are very small and plants sometimes can't get enough air. The water drains away very fast.

Sand

Granular. Does not stick together. Large particles have plenty of air and absorbs water easily. But, the water drains away very fast and dries out quickly. The nutrients also drain out more quickly.

Humus

Decomposed living material made up of leaves, plants, roots, etc. Humus also has living small animals and bacteria. Humus is necessary for healthy soil. It is brown and crumbly. It is a little slippery



Soil Observation Sheet

<p>Soil Sample #1</p>	<p>Soil Sample #2</p>
<p>Soil Sample #3</p>	<p>Soil Sample #4</p>



Lesson 3: Seeds

Objective: In this first class, students will learn the parts of the seed and what roles they play in the growth of the new plant. Each student will also learn how to plant a seed and how to care for the developing young plants. The seeds to be planted are vegetable seeds that will produce plants for the school garden.

Choose one of the following books:

I am a seed, by, Jean Marzolla

Seeds by Ken Robbins

A Seed is Sleepy by Dianna Hutts Aston

Prepared materials:

1. Plant Journal (4 sheets of paper folded into a journal). Have students design a cover for their journal with name and teacher's name on the cover.
2. Tub of moistened potting soil.
3. Planting supplies: 24 4-cell packs, 2 plant trays, 2 domes, packets of seeds (see below), tongue depressors or popsicle sticks for names, extra tub to wash dirt off hands, towel to wipe hands, plastic table cloth to protect tables from dirt
4. Seeds to snack on: pumpkin, sunflower, corn, peas, pine nuts

Outline for a 1 hour class:

1. Gather class together in Meeting Area or at their desks
2. Read the I Am A Seed book.
3. Give a lesson on how to plant seeds into 4-cell packs.
4. Introduce seeds and talk about Cool vs Warm seeds
5. Introduce the Light Tables
6. Discuss the class rotation of planting and working in Plant Journals
7. Clean up
8. Seeds for snack.

Volunteers needed:

Two volunteers to plant seeds with students is ideal. More is great.

Slow Food leader gives class presentation and oversees activities.

Classroom teacher maintains the class as they wait for their turn to plant.



Activity 1: Class Discussion and Book

1. What is the purpose of a seed?
 - Seeds allow a plant to make more plants or offspring.
 - Discussion Point: Ask class to give examples of seeds they have seen in nature or that they have planted at home.
 - Seeds are a food source for some animals.
 - Discussion Point: Ask class for examples of seeds that they have eaten before or that they have seen animals eat in nature.
2. What are the three parts of a seed? Read the book, I Am a Seed.
 - Seed coat-protects inside of seed
 - Cotyledon- food for new plant
 - Embryo- new plant
 - Activity: Have students in their Plant Journal, draw a seed and label the parts.
3. Germination- How does a seed make a plant?
 - Water moistens the seed coat
 - Given the right temperature, the embryo begins to grow into a plant.
 - The cotyledon supplies the new plant with food.
 - The roots start to grow into the potting soil, supplying nutrients to the new plant.
 - Activity: Have students draw the stages of germination in their journals.
4. Germination- What does a seed need to grow?
 - Fine soil- usually potting soil which contains composted plant material, vermiculite, nutrients
 - Water
 - Air
 - Discussion Point: Have a tub of moisten potting soil prepared. Show students the soil and how it is loose and contains different parts. Ask how this potting soil is different than the soil in the garden or in the schoolyard.

Activity 2: Planting Seeds

1. Select a 4-cell seedling tray.
2. Moisten potting soil.
3. Loosely pack potting soil into 4-cell tray, almost up to the top.
4. Place one seed into each cell.
5. Cover seed loosely with more potting soil.
6. Write name on plant stick and place in one cell.
7. Place 4-cell tray into large plant tray.

Discussion Point: Show students how to loosely fill the 4-cell trays with potting soil almost to the top. Talk about putting one seed into each cell and then how to cover the seeds with loose soil. Ask “Do we need to water the seeds after they are in the potting soil?”



How to care for the planted seeds and the seedlings

1. Fill a plant tray with 4-cell packs.
2. Cover plant tray with a dome.
Discussion Point: What purpose does the dome serve? Talk about the water cycle, evaporation and condensation. What should the students observe in a couple of days?
3. Position plant tray on light table shelf.
Discussion Point: Does this tray of plants require a heat pad or not? Talk about “cool” seeds and “warm” seeds.
4. Turn on the lights above the tray.
Discussion Point: The lights serve the role as the sun. When starting seedlings we can leave the lights on for 24 hours to give the seedlings lots of light energy.
5. Watering the trays. While the domes are on the trays, there should be no need to water the trays. All the water stays trapped inside the dome. If the domes get knocked off and the water evaporates, go ahead and lightly sprinkle the potting soil with water and replace the domes.
6. Once seedlings appear, you can leave the dome on until the seedlings reach the inside of the dome. Remove the dome when the seedlings are tall as the dome. You will need to water daily or every other day at this point. Because the seedlings are fragile, an adult should do the initial watering, targeting the base of the plants.
7. As the seedlings grow stronger, students can help to water the plants with a simple watering can.

Types of Seeds to Plant indoors	
Cool Seeds no heat pads	Warm Seeds need heat pads
Broccoli	Tomatoes
Cabbage	Eggplant
Brussell Sprouts	Peppers
Cauliflower	Artichokes
Kale	Okra
Collards	Cotton
Kolhrabi	
Lettuces	

Direct Sow Seeds into the ground:

Peas	Carrots
Beans	Beets
Lettuce	Corn
Radish	Turnips
Squash	Rutabagas
Melons	Pumpkins
Cucumbers	Potatoes
Garlic	



Activity 3: Seed Snack

Option 1:

Have a variety of seeds available for your students to try as a snack. Remember to have everyone wash their hands before they eat or prepare food!

Possible seed snacks:

Pumpkin seeds
Sunflower seeds
Dried peas or corn
Edamame
Bean Sprouts

Questions to ask:

What do we eat that are seeds?
Why are seeds good for us?
-Pass out diagram of seeds

Option 2:

Simple Hummus

olive oil
sesame seeds (or tahini, which is sesame butter)
garlic
lemon juice
canned chickpeas
ground cumin
salt

Put a few tablespoons of olive oil in a blender along with one or two cloves of garlic, a handful of sesame seeds and the juice of a half of a lemon. Blend it until smooth. Add a can or two of cooked, drained chickpeas (also known as garbanzo beans) and blend it up. Taste it. If you like to have a stronger flavor, add more salt and lemon juice. If you love garlic, you can add more of that, too.

Serve with cut up pita or tortillas and:

Grated carrots
Chopped olives
Sweet red pepper
Chopped cucumbers



Activity 4: Watch Seeds Sprout

Materials needed:

Short clear plastic drinking cups

Potting soil

Bean seeds

Fill the cups with damp potting soil. Plant beans in clear cups. Make sure they plant the seeds near the edges of the cup so that they can watch them sprout. Have the students bring them home and observe how long it takes for the seed to sprout. What happens?

You can also leave the cups in the classroom and have the children observe them for two weeks in order to watch them grow.

Wrap Up and Discussion

Transplanting



Lesson 4: Transplanting

Objective: In the second class, the students will learn about parts of the plant while they transplant the young seedlings to larger pots. When the seedlings are taken out of the 4-cell packs, the students can study the roots, stems, leaves and perhaps flowers on their plants.

Accompanying book: *Zinnia's Garden*

Prepared materials:

- Plant Journal.
- Tub of moistened potting soil.
- Planting supplies: 2" and 4" pots, plant trays to hold new pots, tongue depressors or popsicle sticks for names, extra tub to wash dirt off hands, towel to wipe hands, plastic table cloth to protect tables from dirt, watering can

Outline for a 1 hour class:

1. Gather class together in Meeting Area or at their desks
2. Read the *Zinnia's Garden* book.
3. Give a lesson on how to transplant seedlings into new pots.
4. Talk about how to care for seedlings.
5. Clean up

Volunteers needed:

- Two volunteers to transplant seedlings with students is ideal. More is great.
- Slow Food leader gives class presentation and oversees activities.
- Classroom teacher maintains the class as they wait for their turn to plant.

Activity 1: Discussing Plant Botany

Parts of a plant

- Roots- anchors plants in soil, provides nutrients to rest of the plant
- Stem- keeps plants upright, movement of nutrients to leaves
- Leaves- photosynthesis
- Flowers- pollination
- Fruit- holds seeds, edible

Activity 2: Drawing

Have students draw a sample plant into their Journals and label the parts of the plant.

Edible parts of the plant

- Roots- carrots, radishes, beets
- Stem- celery, asparagus
- Leaves- lettuce, spinach
- Flowers- broccoli
- Fruit- eggplant, tomatoes, peppers

Activity 3: Transplanting

How to transplant

1. Have a tub of moistened topsoil ready to go and four 4" pots.
2. Fill 4" pots with potting soil about half way up and make a small indentation in the soil.
3. Take 4-cell pack and loosen the dirt in one cell. Gently pull seedling out of cell with as much dirt as possible.
4. Place seedling into new pot and cover roots with more potting soil. Press down gently on soil and make sure that the seedling is standing tall.
5. Make new nametag and place into pot.
6. Place pot into plant tray.

Activity: While students are waiting for their turn to transplant, have them write the steps of transplanting in their Journal books.

