

Sow and Grow



**A Fresh from the Farm
Garden Curriculum**

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Introduction

“How do I start a school garden?” “How do I maintain the garden once it is built?” “How can I use the garden space as an extension to the classroom?” “How do I know I’m doing it right?” Seven Generations Ahead, a non-profit whose mission is to promote the development of healthy and sustainable communities, has compiled a garden-centered curriculum resource, in direct response to questions like these, as well as to help provide answers and methods for garden-based education.

Sow and Grow uses the local environment as a focal point for learning. Place-based education creates a meaningful and culturally relevant framework for learning. By connecting Common Core concept areas and units of study in their classrooms to gardens and local communities, students have a real-world context for learning. Place-based education opportunities are plentiful in the *Sow and Grow* curriculum.

Most experts agree that a combination of access to and education about healthy food provides the strongest opportunity to influence healthy eating behaviors. The National Association of State Boards of Education (NASBE) Preventing Childhood Obesity School Health Policy Guide concluded that school children need behavior-focused healthy eating education that influences knowledge, attitudes and eating habits and that is coordinated with school meal programs. NASBE also concluded that traditional knowledge-based programs and curricula have not been effective.

Whether wishing to start a school or community garden or seeking to better utilize an existing garden space as part of a classroom, this curriculum provides a range of information and activities to help at every stage of garden education.

Why a Garden?

A garden provides a rich environment for inquiry-based learning where students use academic tools to investigate observations and make discoveries about ecology, agriculture, history, and community. Studies looking at garden based education have shown that students’ involvement in these programs can have a positive effect on academic performance, nutrition, and social development. The cooperative learning atmosphere of a garden strengthens interpersonal skills and builds self-reliance in individuals while exposing them to recreation, exercise, and healthy food.

A garden is also an integral piece in accomplishing *Fresh from the Farm’s* goals:

- Providing fresher, healthier, tastier, safer and more nutritious food to school children by linking them directly to the source
- Developing long-term healthy eating habits by exposing them to the benefits
- Educating the school community about food sourcing through involvement of teachers, parents, administrators, and broader school stakeholders
- Supporting local farmers and a local economy by creating an understanding of the importance of these models

Central Concepts

By focusing on several central concepts, this curriculum provides teachers and students with the resources and activities to start, maintain, sustain, and evaluate their school garden:

- A garden can take many forms and requires planning in order to grow
- The needs of a garden change according to season
- In order to maintain a healthy garden, one must understand the role each part plays - from weeds, to bugs, to seasons - and the potential benefits and challenges of each one
- Soil is a living organism, and only healthy soil produces healthy plants and food
- The waste cycle is an important biological process that can be utilized as a positive asset to a garden
- Much of the food we eat is grown on farms, complex ecosystems in which many organisms are dependent on one another to produce healthy plants for food
- All fruits and vegetables can be connected to a part of a plant and can be specifically cultivated and harvested for grocery stores, restaurants, and dinner tables
- Gardens provide a variety of physical, mental, and environmental benefits for students, teachers, and school communities

Target Audience

This curriculum is written to be inclusive for students in grades 1-8. Following the lessons with a target audience of “grades 5-8” are recommended adjustments aimed toward a younger audience - grades 1-4. These adjustments are at the conclusion of the lesson. Each lesson with a younger audience adjustment is marked with an inchworm 🐛 and the adjustments are at the conclusion of each lesson.

Sow and Grow Curriculum Organization

Sow and Grow is organized along a knowledge continuum that is logical for the growing process. This curriculum is designed to be extremely flexible allowing teachers to customize the content and location of each lesson to suit his or her needs. Therefore, the grid below shows the **recommended** time and places to teach each of the *Sow and Grow* lessons. However, this is merely a guideline and teachers should feel free to modify the order as they see fit.

Lesson	Where to teach?		When in the garden process to teach?			What time of year to teach?			
	Indoor	Outdoor	Planning	Growing	Harvesting	Fall	Winter	Spring	Summer
School and Community Gardens	•	•	•			•	•	•	•
Urbs in Horto	•	•	•			•	•	•	•
Harvest Calendar	•	•	•	•	•	•	•	•	•
Garden Transitions	• (Winter)	• (Fall)	•	•		•	•		
Plant Life Cycle	• (Winter)	• (Spring)		•			•	•	
Plant Parts	•	•	•	•	•	•	•	•	•
Plant Parts We Eat	•	•			•	•		•	
Dandelions, Crabgrass, and Burrs, Oh My!	•	•		•	•	•		•	•
Pest or Pollinator?		•		•		•		•	•
What's in Soil?		•	•	•	•	•		•	•
Soil on Earth	•		•			•	•	•	•
Soil Experiment	•		•	•	•	•	•	•	•
From Waste to Resource	•		•	•	•	•	•	•	•
Classroom Composting	•			•	•	•	•	•	•

Mindful Tasting

One of the most appealing pieces of gardening is the promise of the harvest, and one of the best ways to appreciate the season's hard work is through mindful tasting, or tasting using all of one's senses.

On the next page is a chart to help guide students and teachers through the mindful tasting process as well as a list of adjectives corresponding to the 5 senses. When using this method, encourage students to think critically about their experience - use sensory descriptions to describe preference, or use similes and metaphors to compare the food/experience to other things - and challenge them to try new things.



Mindful Tasting



Use your 5 senses! Write an adjective to describe this food in each sense box. You can use the Tasting Words for help.

LOOK	SMELL	SOUND	FEEL	TASTE

My Tasting Words

LOOK	SMELL	SOUND	FEEL	TASTE
Smooth <i>yogurt</i>	Bland <i>white bread</i>	Crunchy <i>carrot</i>	Smooth <i>yogurt</i>	Strong/intense <i>salsa</i>
Shiny <i>yogurt</i>	Fresh <i>lettuce</i>	Crisp <i>apple</i>	Dry <i>cracker</i>	Spicy <i>jalapeno</i>
Big <i>watermelon</i>	Sweet <i>berry</i>	Juicy <i>berry</i>	Rough <i>crusty bread</i>	Flavorful <i>pepper</i>
Small <i>pea</i>	Sour <i>lemon</i>	Squeaky <i>cheese</i>	Soft <i>peach</i>	Light/mild <i>potato</i>
Long <i>celery</i>	Strong/intense <i>salsa</i>	Quiet <i>applesauce</i>	Hard <i>nuts</i>	Bland <i>white bread</i>
Bumpy <i>pineapple skin</i>	Spicy <i>jalapeno</i>	Mushy <i>banana</i>	Juicy <i>berry</i>	Sweet <i>berry</i>
Wrinkly <i>raisin</i>	Savory <i>soup</i>	Rough <i>crusty bread</i>	Heavy <i>watermelon</i>	Sour <i>lemon</i>

Lesson Objectives

LESSON 1: SCHOOL AND COMMUNITY GARDENS

- Students will maximize garden growth in a limited planning space
- Students will draw parallels between the basic needs of humans and those of plants

LESSON 2: URBS IN HORTO

- Students will observe that gardens take many forms
- Students will consider all of the elements of designing, planting, and maintaining a garden
- Students will design a community garden plan and justify their choices

LESSON 3: HARVEST CALENDAR

- Students will examine the tasks a farmer does on the farm during each month
- Students will differentiate between growing and harvest seasons
- Students will identify the annual cycles of work on a farm

LESSON 4: GARDEN TRANSITIONS

- Students will observe and evaluate the needs of a garden according to the season
- Students will create a list of garden tasks according to season and formulate a plan to implement them
- Students will prepare the garden space for the coming season

LESSON 5: PLANT LIFE CYCLE

- Students will identify the 8 stages of the plant life cycle and the unique characteristics of each stage
- Students will identify at what stage different garden crops are ready for harvest

LESSON 6: PLANT PARTS

- Students will identify the six parts of the plant
- Students will assess how each plant part contributes to the plant's survival
- Students will recognize visual characteristics of each plant part
- Students will categorize different fruits or vegetables based on plant parts.

LESSON 7: PLANT PARTS WE EAT

- Students will identify fruits and vegetables as parts of a plant
- Students will be able to make connections between plant part function and nutritional benefits

LESSON 8: DANDELION, CRABGRASS, AND BURRS, OH MY!

- Students will evaluate which plants are “weeds” in the garden
- Students will name beneficial and/or harmful properties of weeds

LESSON 9: PEST OR POLLINATOR?

- Students will discriminate between helpful vs. harmful bugs
- Students will define four different roles bugs may play in a garden
- Students will examine the value of a diverse presence of organisms in a garden space

LESSON 10: WHAT'S IN SOIL?

- Students will analyze soil samples and identify the five components of soil
- Students will predict how organic matter breaks down to form healthy soil
- Students will assemble “ingredients” and create the beginnings of soil

LESSON 11: SOIL ON EARTH

- Students will appraise the value of soil based on the amount of fertile soil available on Earth
- Students will predict how not having access to healthy soil affects the people who live nearby

LESSON 12: SOIL EXPERIMENT

- Students will differentiate between soil types
- Students connect plant needs to which soil type is best suited for them

LESSON 13: FROM WASTE TO RESOURCE

- Students will identify decomposition and observe how it leads to compost
- Students will link composting to the plant cycle
- Students will use the waste cycle to create a valuable garden resource

LESSON 14: CLASSROOM COMPOSTING

- Students will utilize a natural function to create a valuable garden resource
- Students will build and maintain a classroom worm compost bin

Lesson 1:
School and Community Gardens



Time Allotted

60 Minutes

Target Audience

Grades 1-8

Objectives

- Students will maximize garden growth in a limited planning space
- Students will draw parallels between the basic needs of humans and those of plants

Materials

- Art supplies (crayons, markers, pencils, pens, glue, scrap paper, construction paper, scissors)
- Magazines—specifically gardening, housekeeping, food, and outdoor magazines

Summary

Through discussion and brainstorming, students will consider different factors such as location, type, useful resources, requirements, space, and growing methods associated with a shared garden space and how these concepts will apply to their own garden design and space.

Background

School gardens — whether window, container, or outdoors — can enhance the emotional, social and physical health of its students and school community. The presence of living plants in schools has been shown to increase information retention by both students and staff¹. Gardens provide teachers of all subject areas with hands-on learning opportunities in an alternative setting and expose students to the joys of growing their own food. Additionally, students working in a garden are able to draw parallels between their own basic needs and those of plants and connect the health of plant life with their own.

Large or small, a garden can be any place a person decides to grow food or ornamental plants. Students will begin to understand that in an urban environment, where space is limited, a garden simply means a space where they take care of plants. Reimagining our definition of what a garden can be can will open possibilities to what it could be. In this lesson, students will begin to relate the needs of their bodies to those of plants and understand that plants are living beings that respond to their environment. Students will also learn different ways to consider space and plant growth and how to use this information to maximize their own garden space.

Method

1. Begin this lesson by facilitating a general garden discussion, using the following questions as a guide:
 - *What does a garden look like to you?* (Encourage them to use words and images - magazine clippings or drawings - if possible).
 - *Are there any gardens around the school or in your neighborhood? What do these gardens look like?*
 - *What do you think are some important elements and conditions that make a successful garden? A school garden?*
 - *Who or what would be good resources to consult when trying to create your own garden?*
 - *What do you think are some basic requirements of creating a garden space?* (Have students brainstorm 5 basic requirements—aside from the space and plants—to get a garden started)
 - *How are the needs of a garden/plants similar to those of a human?*

¹http://ellisonchair.tamu.edu/health-and-well-being-benefits-of-plants/#.Ux2_gfSwKWg

- In small groups, have students create a Venn diagram comparing their survival needs to those of a plant. The outer circles will have needs unique to humans or plants and the overlap will show shared needs. Have them share their diagrams. Understanding the fundamental similarities will help them to understand many of the changes that occur in the garden.
- Often, when gardening, we are working within a limited space. In order to achieve the highest yield or harvest possible within this space, it is important to know a few things. After learning about plant cycles, parts, and parts we eat (see lessons 6 and 7), consider: Where do these plants grow (below ground, above ground, on vines, on trees, etc)? When planning a garden, it is useful to know these things when choosing which plants will work best in the space you are working with.
- Briefly introduce methods of growing (or have students research different methods) using illustrations, or diagrams. There are many different planting methods used in gardening, dictated by the garden's intention, crops grown, region, intended results, etc. Some gardens are planted directly in the ground — conventional row design — whereas others are built in containers or raised beds; some have single crops grouped, whereas others interplant multiple crops — as with intensive planting.
- Briefly explain the concept of “intensive planting.” **Intensive planting** broadly means “growing more in a limited space” and can include **inter-planting** (planting a mix of crops in the same place) and planting in layers. One way to describe the latter method is through a comparison to the natural layers of forest growth: canopy, low-tree, shrub, herbaceous, ground cover, rhizosphere (below ground), and vertical (vines and climbing plants). Within a garden, we also have layers (albeit, on a much smaller scale) and planting crops considering not only surface area, but the space below and above ground is an effective way of maximizing space.

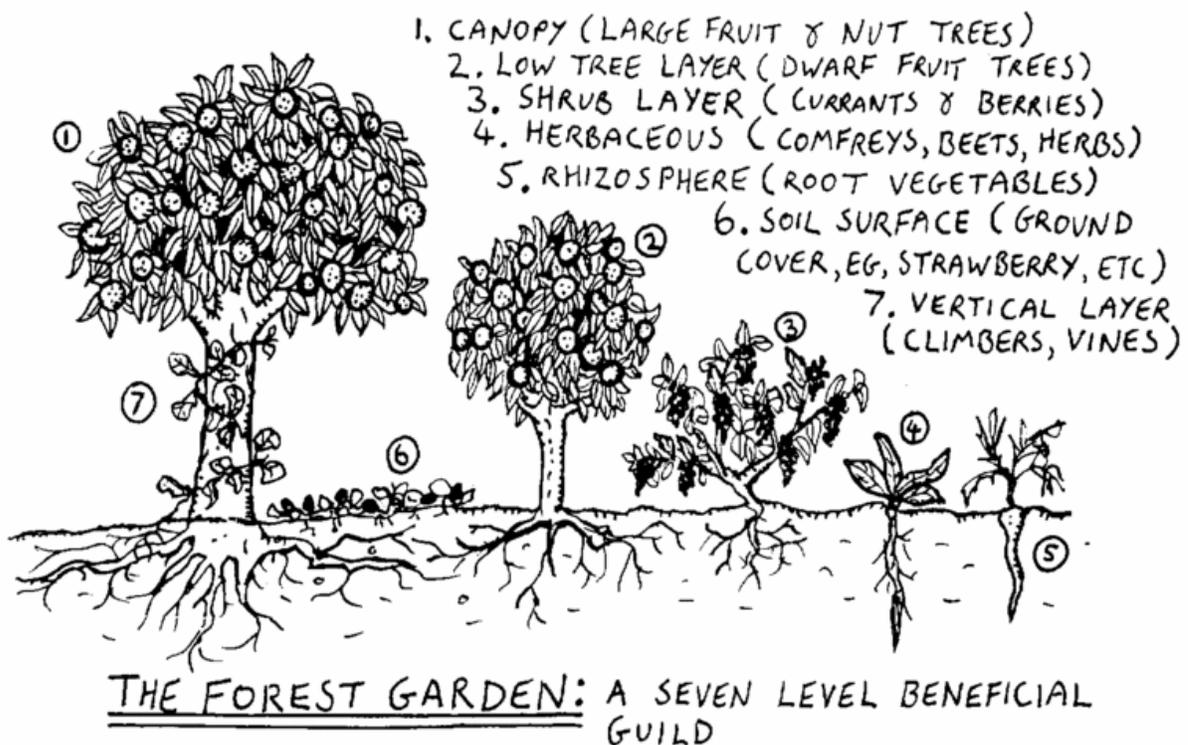


Diagram by Graham Burnett, permaculturalist.

Extensions

- Give students a hypothetical 4'x4' plot and have them research crops based on requirements such as **zone**, spacing, height, and light. Based on their findings, have students select crops to “plant” in their plot; have them draw and present their findings and final “garden space.”
- Have students research alternative growing methods for different climates and regions around the world — terraced gardening in mountainous regions, hydroponics, rooftop gardening, vertical gardening, etc.
- Have students research planting strategies, such as interplanting and companion planting. **Interplanting** is the practice of planting a fast-growing crop between a slower-growing one in order to make the most of your garden space. An example of this would be sowing lettuce seeds between broccoli plants; the lettuce will grow happily in the space and shade provided by the broccoli plants, and you will be able to harvest it before the broccoli is large enough to totally shade it out. **Companion planting** is putting plants together for mutual benefit, such as increased yield or bug attraction/repellence. Visit <http://www.garden.org/ediblelandscaping/?page=201005-interplanting> as a starting place.