



MASTER GARDENER WORKSHOP SERIES

GLE's in the Garden



Using Gardens as an Experiential Laboratory

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Today's Objective:

Learn how to use gardens to enhance student learning for the Plant Growth and Development Units and other Life Science Units in the GLE's.



Today we will cover:

- ❖ Why have a school garden
- ❖ *Student learning goals*
- ❖ Teaching out of the garden



Why Have a School Garden?

Experiential learning laboratory for:

- Life Science units - Plant Growth and Development, Butterflies, Seasons, Temperature, Energy, Climate
- Math - measuring, counting, angles, fractions,
- Social Studies – 3 Sisters Garden (History), hunger
- Writing and Reading – garden journals, seed packets
- Art and Music
- Community Service and cooperative learning



Student Learning Goals

- Children will experience the whole cycle of plant life: Seed – seedling - mature plant – harvest – compost excess plant material
- Children will understand where food comes from and what it takes to grow it
- Children will develop confidence and competence about growing food
- Children will eagerly sample and eat what they have grown – healthy food will not be a mystery to them



Student Learning Goals

- Children will enjoy the out of doors, getting them off their bottoms and away from their screens
- Children can help their community - Plant a Row, food pantries, etc.
- Gardening is not a team sport – once learned it's something children can do on their own with little adult supervision



Teaching out of the Garden: Candia's 3rd Grade Plan

- K through 8th grade school
- About 450 students?
- Two 3rd grade classes – 36 students
- One teacher had garden experience the other didn't
- School Garden program was initiated by the health teacher
- UNH Cooperative Extension involved from start



3rd Grade Plant Growth and Development Unit

Parts of plant and function, Growth Cycle, Environmental interaction

S:LS1:3-4:2.2 Identify and describe the function of the plant structures responsible for food production, water transport, support, reproduction, growth and protection. Candia Student Friendly Language – “I can describe each part of a plant and what it does”

S:LS1:3-4:2.3 Identify and explain how the physical structures of an organism (plants or animals) allow it to survive in its habitat/environment(e.g., roots for water; nose to smell fire). Candia Student Friendly Language – “I can point out and explain why special parts help an animal or plant live in a certain area”.

S:LS1:3-4:2.4 Identify the basic needs of plants and animals in order to stay alive (i.e., water, air, food, space). Candia Student Friendly Language – “I know that all living things need for things in order to live: air, water, food and space.”

S:LS1:3-4:3.2 Recognize that plants and animals move through life cycles of birth, growth and development, reproduction, and death: and explain how these life cycles are different for different organisms. Candia Student Friendly Language – “I know that plants and animals have particular life cycles. I know that each living thing’s life cycle can be a little different from one another”.



Matching School Plan to Plant Life Cycle

- Cycle starts with warm soil (50 degrees at 3 inches deep) and adequate sunlight
- Spring gardens can be planted between April 1st and April 15th to harvest by June 15th.
- Fall garden planting should start the 2nd day of school with harvest completed by Thanksgiving



Candia's Schedule Modification

- From 10 sessions during a two week period in May
- To 10 sessions once a week on a Friday afternoon starting in mid April
- Worked in garden first then came in for lessons



Collect Your Supplies

Black plastic sheets

Cleaned liter soda bottles

Rolls of bulletin board paper

Measuring and marking tools

1" masking tape

Rolls of flagging tape

Jumbo craft sticks

Seeds

Small seeding pots

Milk cartons from cafeteria

Grocery store produce bags

Waterproof trays

Journal pages

Sprinkler watering can

Baskets for harvesting

4 wooden pallets for compost bin



The Vegetables

We recommend you start with

Leaf Vegetables

- Lettuce, pelleted
- Swiss Chard
- Spinach
- Peas

Root Vegetables

- Beets
- Carrots, pelleted
- Radishes

Select varieties that mature in 60 days or less



Indoor Preparation

Students make full-sized template(s) of the bed(s):

1. Provide large sheets of paper (bulletin board paper), measuring and marking tools
2. Provide bed dimensions
3. Students are divided into groups to measure, cut and tape full-sized templates.
4. When the template is finished, students draw in a square-foot grid on the bed template.
5. Mark template with directional North to aid placing taller plants behind shorter ones
6. Write vegetable name in each template square (taller plants to the North)



Indoor Preparation

Prepare packets of seeds for individual squares:

- Students count out correct number of seeds for their square and place in snack baggie
- Students write their name on one side of jumbo craft stick and veggie name on the other side

Lettuce: 4 seeds per bag

Swiss Chard: 4 seeds per bag

Spinach: 9 seeds per bag

Peas: 12 seeds per bag

Beets – 12 seeds per bag

Carrots – 16 seeds per bag

Radishes – 16 seeds per bag



Using Seedlings in the Spring

Cover beds with black plastic and start leafy greens seedlings indoors.

Use a sterile see starter mix, not soil

Use small peat pots, seed starter pellets or make newspaper pots

Use cleaned milk cartons as trays for pots

Be sure to mark milk cartons with student and vegetable names

Place milk cartons/seedpots inside a plastic bag and seal

Remove milk carton from plastic bag as soon as seed emerges, place sunny location and keep moist (not soggy).



Garden Journal:

What Candia Students did

Began garden journal entries with the first trip to the garden.

Took their writing journal to the garden each week.

Made a color drawing of their observations of their square.

Labeled all items in the drawing.

Wrote a narrative including garden activities of the day, observations of change, thoughts about the garden, and questions they had.



Out to the Garden: Preparing the Bed

- Spread one inch of compost on top of soil (do not till in)
- Lay square foot grid out on the bed
- Use flagging tape and jumbo craft sticks to hold ends of strips in ground

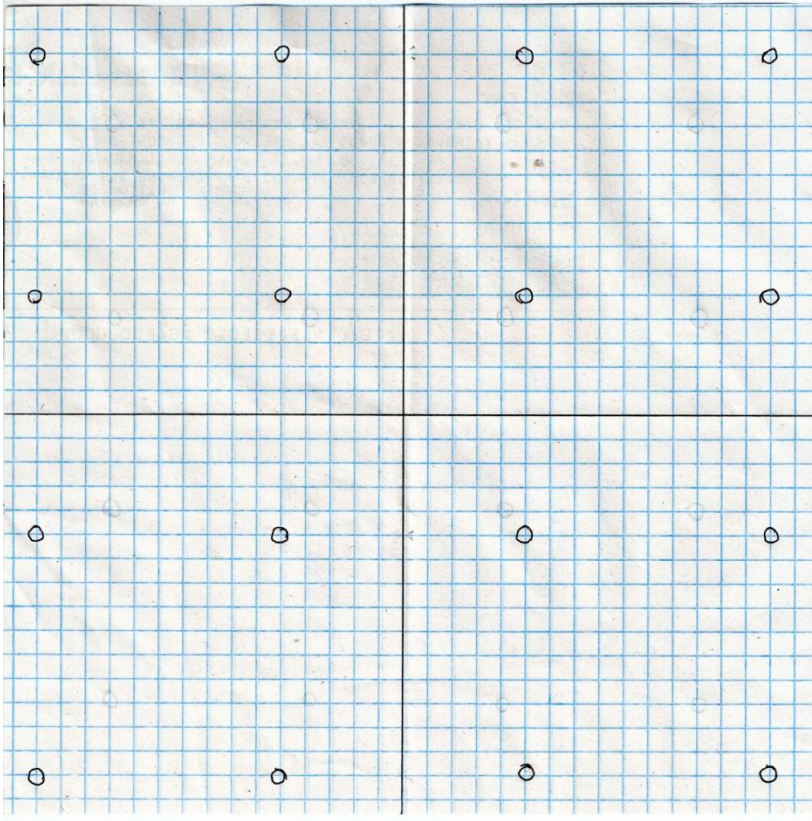


Out to the Garden: Planting

1. Students divide their square into 4 smaller squares (draw tick-tack-toe for spinach – 9 seeds)
2. Place seeds evenly in each resulting square
3. Each seed is pushed down fingernail deep.
4. Peas, a larger seed, are pushed down to the second knuckle
5. Gently brush the surface of the square to cover the seeds and fill depressions
6. Water the square thoroughly with sprinkler can
7. Place the craft stick label in one corner with the veggie name facing out



Out to the Garden: Seedlings



1. Same number of seedlings as seeds are placed in the squares
2. A hole the size of the pot is made for the seedling
3. The milk carton is torn open and the pot with the seedling are placed into the hole and patted in



Out to the Garden:

Tending your squares

- Determine a weekly schedule for students to visit the garden
- They will observe their square, pull any weeds that have sprouted and water as needed.

A Master Gardener can help students differentiate between seedlings and weeds and determine when they need to water



Out to the Garden: Harvesting your bounty

- Harvested veggies can be brought into classroom for students to sample.
- Students should not be required to sample anything. Once they sample a vegetable they know they like, they usually go on to sample everything.

A Master Gardener can help students with how and when to harvest



Closing up the Garden:

In the Spring:

Beds are cleared and flagging tape grids removed. A cover crop is sown (crimson clover, i.e.) to carry the bed through the summer then turned in as “green manure” before September planting

In the Fall:

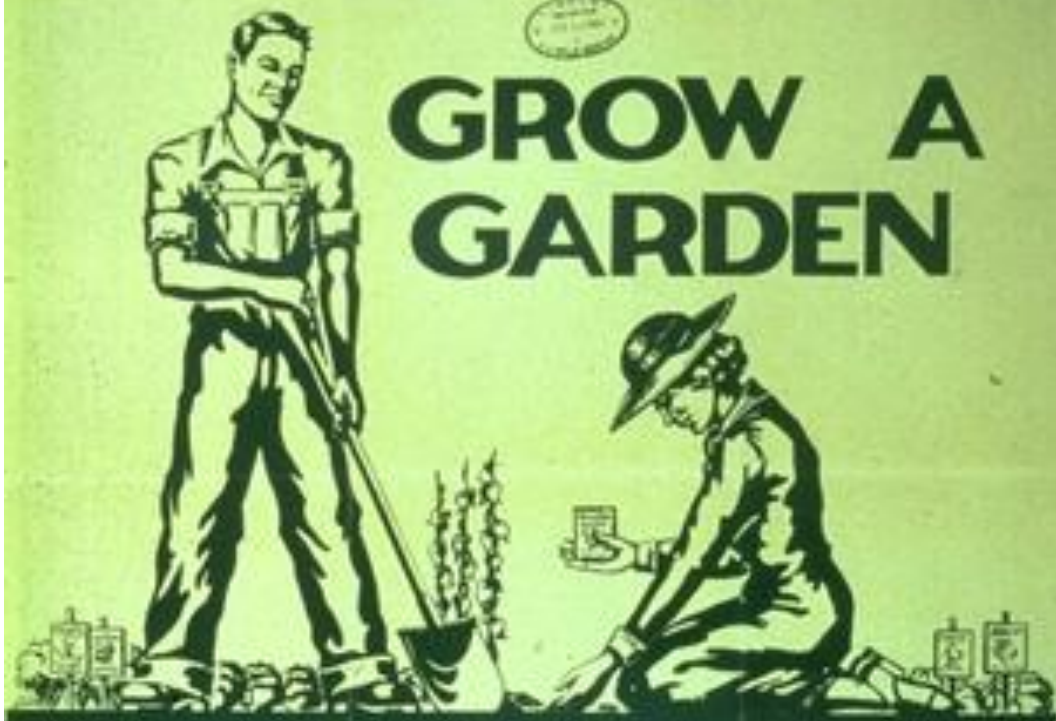
Bed can be covered with a thick layer (4+ inches) of leaves. Leaves are removed in the Spring. Black plastic is laid over the bed to warm the soil in preparation for planting.



SAVE MONEY THE EASY WAY



GROW A GARDEN



IT'S THRIFTY
IT'S PATRIOTIC
PLANT TO-DAY!



Thank You



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Germination – Planting – Transplanting

Vegetable	Seed Germination		Date Sprout Observed	Sprout to Transplant	Sprout to Harvest	Height	# per Sq. Foot
	Soil Temp Range	Days to Germination					
Lettuce	40° - 80°	7 – 14 days		5 – 7 wks	4 – 7 wks	6 – 12 in.	4
Spinach	45° - 74°	7 – 10 days			4 – 7 wks	6 – 12 in.	9
Swiss Chard	50° - 85°	7 – 14 days			4 – 7 wks	12 – 18 in.	4
Peas	40° - 75°	8 – 10 days		(Direct sown Only)	7 – 10 wks	24 in.	12
Carrots	45° - 85°	10 – 21 days		(Direct sown Only)	8 – 10 wks	12 in.	16
Beets	50° - 85°	7 – 14 days		(Direct sown Only)	7 – 10 wks	12 in.	12
Radishes	45° - 90°	3 – 7 days		(Direct sown Only)	4 – 5 wks	6 – 12 in.	16



New Hampshire Curriculum Framework Garden Science GLEs

Life Science

S:LS1:4:2.3. Identify and explain how the physical structures of ...(plants) allow it to survive in its habitat/environment (e.g. roots for water, ...).

S:LS1:4:2.4 Identify the basic needs of plants and animals in order to stay alive (i.e. water, air, food, space).

S:LS1:4:3.2 Recognize that living organisms have life cycles, which include birth, growth and development, reproduction, and death:...

S:LS1:4:3.3 Describe the reproductive process of plants, explaining some plants grow from seed, while others grow from the of other plants.

S:LS1:4:3.4 Predict, sequence, or compare the life stages of organisms (plants...)e.g. put the images of life stages of an organism in order, predict the next stage in sequence,,,

S:LS2:2:1.3 Recognize that some plants ...go through changes in appearance when the seasons change.

S:LS2:2:2 .1 Identify the resources plants ... need for growth and energy, and describe how their habitat provides these basic needs

S:LS4:4:2.1 Explain how the amount of rest and the types of food, exercise and recreation humans choose can influence and affect their well-being

S:LS5:4:2.1 Demonstrate the use of appropriate tools and simple equipment, such as thermometers, magnifiers and microscopes to gather data and extend the senses.

Physical Science

S:PS2:4:3.5 Explain that light travels in a straight line until it strikes an object...

S:PS2:4:3.8 Experiment, observe, or predict how heat might move from one object to another.

S:PS4:4:2.1 Demonstrate how to use tools, such as magnifiers, scales, balances, rulers, and thermometers to gather data and extend the senses.

Earth Space Science

S:ESS1:2:1:1.1 Recognize that weather conditions change frequently, and that weather patterns change over the seasons

S:ESS1:2:1.2 Describe and compare weather using observations and measurements of local weather conditions

S:ESS1:2:6.2 Describe rocks and soils in terms of their physical properties

S:ESS2:4:2.1 Recognize that the Sun provides the light and heat necessary to maintain the temperature of the Earth

S:ESS4:2:2.1 Recognize and...demonstrate the use of tools to gather data and extend the senses such as thermometers, hand lenses, (rain gauges), and balances.

S:ESS4:4:3.1 Distinguish between and provide examples of materials that can be recycled/reused and those that cannot

Science Process Skills

S:SPS1:2:1.2 Record observations using language, concrete objects, and symbolic representations

S:SPS1:2:3.2 Follow a simple step-by-step procedure

S:SPS2:2:1.1 Recognize that information can be obtained merely by careful observation, but sometimes even more data can be collected by conducting scientific investigations.

S:SPS3:2:1.1 Work with a partner to accomplish a specific task

S:SPS3:2:1.2 Take turns

S:SPS3:2:3.2 Provide examples that highlight the importance of the planning phase of any project.

S:SPS3:4:2.1 Demonstrate a basic conservation action such as recycling or a schoolyard habitat project.

S:SPS4:2:6.1 Plan and carry out simple activities with a group

S:SPS4:2:6.1 Keep a visual or written journal



Research supporting the benefits of school gardens:

www.kidsgardening.org/article/research-supporting-benefits-school-gardens

