



Garden Planning & Lesson Plans

Linked to the New Jersey State Standards for K-5

November, 2007

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Princeton School Garden Cooperative

Helping Students and Gardens Grow all over Town!

Are you interested in expanding your classroom into a school garden? Then, read on.

The Princeton School Garden Cooperative is a group of individuals who believe in garden based education and in re-connecting students to the earth's bounty in the garden, the classroom and the cafeteria. Our goal is to create flourishing edible gardens at every Princeton Public School K-12 and to share ideas and lesson plans with anyone and everyone so they can grow edible teaching gardens at their schools, community centers and even their own homes.

Princeton now has outdoor garden classrooms in every public elementary school! The Cooperative has worked with committed teachers, principals, parent volunteers and students at each of these schools to design, plant, water, weed and nurture the gardens into being. We hope this guide will further the growth of these gardens into the classroom curriculum.

The following pages contain how to steps for composting, planning and planting your edible garden as well as lesson plans and curriculum links for math, social studies, language arts, science, visual arts and health. The teachers at the Riverside Elementary School in Princeton, New Jersey have generously provided the majority of the material for this first installment. However, The Stony Brook Millstone

Benefits of Garden Based Learning

- *Teaching in a real life setting:* In math, there are hands-on opportunities to use measurement, value, precision. Students see the consequences of not being precise, and the importance of checking each other's work. Activities include measuring in three dimensions, area, volume, perimeter. And, following the directions using word problem and complex problem solving.
- *Learning across grades:* Older children can create the lasagna garden as a math lesson. Younger children can use the garden for a content project like planting a rainbow or small pumpkins.
- *Linking lessons to existing curricula:* History-third grade colonial herb garden. Science- second grade butterfly life cycle garden. Health and safety lessons- using the senses of vision, smell and taste to determine safe plants to eat. Language arts- fourth grade exercise in using precise language to describe a complex problem.
- *Hands-on learning that brings in parents and members of the community.*
- *Outdoor learning for children keeps them healthy:* solving problems in real life settings, using their hands and simple tools, and potentially having food or herbs to harvest or share are all healthful activities.

Watershed also shared a number of creative exercises. As our gardens grow, we hope everyone including you will share their ideas, lesson plans, photos and more. Please keep this guide in a three ring binder because there are more installments to come.

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- All photos were taken by Jim Foss of Somerset, New Jersey at the Riverside Elementary School edible schoolyard in Princeton, New Jersey.

Any questions? Thoughts? Information or lesson plans to add to this document? Email:
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Planning Your School Garden

This chapter can be linked to the Career Planning and Consumer and Family Life Skills 9.2.



The Riverside Elementary School garden.

You've heard of the three R's in the classroom. Well in the garden we have the three P's: **Planning** the garden, **Preparing** the soil, **Planting** the seeds. Students can be involved from day one in all three. Even if you already have garden beds, there is still work to be done to amend the soil, decide what to plant and where to plant it.

Planning the Garden

If you don't have a garden here are a few tips to follow to get you started. If you do, you may still wish to do steps one and two to be sure you know where you are headed.

- **Gather Your Team:** Whether it is your classroom, the entire school, a group of teachers or an after school club. Find out why people have come and what they may already know about gardening. Identify their strengths. One person may love to pull weeds but has no desire to plant or harvest. Someone else may know a lot about composting while still another person knows how to make tea from herbs.
- **Write a mission** for how your class, club or school wish to use the garden. See the chapter called *Accomplishments to Date* for information on mission statements.

- Find the perfect spot. There must be a place somewhere in your school yard that gets enough sun that you could cultivate. Identify a space and then do a check at different times every day to find out how much sun it gets. It is best to get six hours of sun if you plan to grow vegetables.
- Make sure to discuss the project with the Principal, teachers or those in charge at your school before digging.

Preparing the Soil

- Take any rocks, sticks or clay from the soil and break up any hard clumps
- Add compost or mulch to the soil and mix it in thoroughly with shovels

Planting Seeds or Plants

- Plant seeds in the early spring (mid-May) after the last frost
- Plants can go in mid-May or later
- Water thoroughly/drench the soil really
- Then every other day, weed, water and watch them grow

Accomplishments to Date



If you begin your school garden project with a mission statement, good things should grow. A mission statement makes your dream come to life and if you involve students, teachers, advisors and even parents in devising the mission you will create interest and ownership in your garden plot.

Each of the public elementary schools in Princeton, New Jersey have developed their own mission statement to best reflect the role of the garden at their school. Using these statements they went on to create gardens that are used by teachers and students today. You may want to pull from these to create a mission statement for your classroom, school or organization. In alphabetical order:

Community Park Elementary School Mission Statement

Mission Statement:

The Community Park School seeks to establish self-sustaining edible gardens, involving the whole community --parents, school, administration and faculty, local chefs and culinary professionals, businesses, Princeton University students, faculty and gardening/environment and conservation organizations in the process. We further seek to integrate grade-specific food literacy (nutrition and health, palate, cooking, shopping, growing, environment).

2006-07 Accomplishments:

This new garden had a very productive year. The parent organizers succeeded in attracting a teacher who became a staunch advocate for garden based learning. With her help every person -- from secretary to kindergartner -- was involved in the garden in one way or another. They have been producing vegetables all summer long and into the fall. Peas, beans, tomatoes, corn, basil, pumpkins gourds and more have

been enjoyed by the families who tended the garden over the summer and by the students who have been learning in it ever since.

Parent volunteers built trellis structures for climbing plants, as well as two more beds, so that there are now six beds. One garden bed per grade level.

It is reported by the school's volunteer coordinator that teachers are clamoring to expand the gardens, so the goal for 2007-08 school year will be to work with the faculty and staff to expand in a way that is inviting, not intimidating, in scale, and to move forward in developing more in-depth curriculum, throughout the grade levels.

Johnson Park Elementary School Mission Statement

Mission Statement:

The mission of the Johnson Park Courtyard Garden is to create and sustain an organic garden that will serve as an outdoor classroom for our students. The garden will be used to provide hands-on experiences that enhance curriculum in many areas including science and math. It will also enhance awareness of healthy food choices and an appreciation of the outdoors. Students will be involved in all aspects of gardening including planning, planting, tending, harvesting and preparing healthy foods.

2006-07 Year Accomplishments:

Over the Summer of 2007, Johnson Park hired an individual to help clear out beds, weed, mulch and seed areas that needed it. A few families came in and watered, weeded and harvested the vegetables and herbs that were planted with the students during the Spring of 2006. They planted and harvested carrots, lettuce, beans, tomatoes, cilantro, basil, sage and parsley. The parent spearheading the garden at Johnson Park said, "This was the first time I had planted from seed. The carrots were a big hit!"

Johnson Park also planted a pumpkin patch with the Kindergarteners and the pumpkins are now blooming. A compost project was also begun which the kids and staff. Most recently, the fourth graders made pesto with the remaining basil from the garden. They mixed it with pasta and served it at the school picnic. It was not only a fun activity but it was also delicious. In the Fall of 2007, Johnson Park is planting bulbs, fall annuals and picking the pumpkins the students so lovingly planted this past spring. In the meantime, on the days that a parent volunteer is in the garden, students can choose to go to the garden rather than go to recess!

Littlebrook Elementary School Mission Statement

Mission Statement:

The Littlebrook Elementary school garden will be a living, edible classroom in our courtyard that will supplement and enhance the curriculum, provide fresh produce to the cafeteria and community and actively include teachers and students in every stage of the garden's growth and development.

2006-07 Accomplishments:

In 2006, there were only weeds in this school's courtyard and an expanse of lawn. In one year, much has happened. The work began when the garden club was formed with 15 families who first met in August of 2006 one day a week to pull weeds and tame overgrown bushes. This group continued to meet one afternoon a week after school to plant, plan and weed. From there, a Littlebrook alum and aspiring Eagle Scout took the group's dreams of an edible school yard and made them a reality.

Princeton High School student Robbie Schaughnessy, who received his Eagle Scout badge after completing his work in the Littlebrook garden, built three raised beds, four low beds an outdoor chalkboard, and a pond with a solar powered pump which is now surrounded by native grasses. Come Spring, the Littlebrook garden club roto-tilled and amended the soil with compost that they had created from the fruit and vegetables they had eaten at snack as well as grass clippings and torn up newspaper. The compost matured during the winter. The club also planted two apple trees, a pear tree, heirloom peas, beans, lettuce, tomatoes and squash as well as strawberries and herbs. All of which are flourishing. In the Spring, Littlebrook harvested enough peas for every teacher to taste and for all fifteen garden club families to bring home to eat. Thus far, the science teacher, who assisted in the creation of the garden, has used it to plant ginger and garlic, measure the acidity of the soil, assist in the creation of the pond and planted lettuce for a unit on temperature and growth with a first grade class.

Riverside Elementary School Mission Statement

Mission Statement:

The purpose of the Riverside School organic garden is to provide inviting, engaging, instructive and authentic outdoor classrooms for the education and pleasure of our students. Specifically, we seek to provide a living laboratory for hands-on learning experiences across the curriculum; to teach children about healthy food, eating habits, and growing food; to promote meaningful outdoor activity; and to foster cross-grade relationships and connection to the wider community.

2006-07 Accomplishments:

Riverside Elementary School's garden has been growing for six years. Planted after the tragedy of September 11th by a parent, it is now a most amazing teaching garden containing a 35 x 35 vegetable garden filled with tomatoes, peppers, lettuce, spinach, herbs and flowers of every shape and kind. There are also pumpkins and gourds. The garden provides produce for families who volunteer during the summer. The harvest has also gone to Camillo's Café in the Princeton Shopping Center and The Bent Spoon, a gelato shop in Palmer Square and the Whole Earth Center grocery store in Princeton.

There is also a 35x 65 organic instructional garden that many of the teachers use for classes in everything from math, language arts, health and art. The walkways are filled with sunflowers. The garden at Riverside continues to flourish with the help of students, parents, teachers, community members and a very committed volunteer coordinator.

Composting



What better place to find organic matter than in the school cafeteria? From all those apple cores and banana peels can come gorgeous compost. You just need a bit of organization and some buckets to carry the food out to the garden. Ace Hardware has buckets that are just the right size with handles and lids (they have been known to give them free to a good cause if you don't mind their name printed on them) Next, identify one day a week as compost day! Assign the job to third grade students who are learning about the environment. You may want to buy a large compost bin for outside, or make a compost cage with chicken wire or just throw the scraps to the worms and let them do the work (see information on vermi-composting further down in this chapter). However you can find a way to create compost, your garden will thank you.

What is Compost?

Compost is organic material that nourishes the soil and helps the garden grow. The best part is you can make it yourself using scraps from the cafeteria and weeds and plants from the garden. Any fresh fruit or vegetables can be turned into compost and returned to the soil. You can also use egg shells, cut up newspaper (if the newspaper uses vegetable based inks), grass clippings, coffee grounds, used tea bags and more.

The benefits of compost:

- It helps plant growth
- It suppresses disease-causing organisms that are found in the soil.

Composting Assembly: An All School Introduction

A presenter brings in an assortment of foods you can compost and foods you can't compost. For instance, fruit peels, eggshells and coffee grinds can be composted. But meat, sandwich bread, milk cartons and cookies can not be composted.

The children define the term: "making distinctions"

Then signs are given out into the audience that read:

- Compost
- Garbage
- Save
- Recycle

Children hold signs when different items are held up for discussion.

Some things are tricky. For instance, if a whole banana and a whole apple are held up, the group might identify them as compost — but, no, they are still good to eat!

Compost can be egg cartons and torn up newspaper too.

Kitchen scraps: fruit and vegetable peelings, fruit and vegetables except for those that have fruit flies, tea leaves and bags and coffee grounds, nutshells, eggshells.

House refuse: vacuum bag contents, dog and cat hair, feathers, old wool sweaters and old wool carpet, old cotton garments or sheets, newspaper.

Types of Composting

There are a lot of ways that you can use the above items to create compost from the lists of items above.

- Open Air: or aerobic: This compost is left uncovered and turned periodically with a shovel or rake. Oxygen in the air aids the decomposition of the matter. Keep the heap aerated, protect it from the weather. Its internal temperature should be around 122 degrees F. In about 8 weeks you should have created a lovely nutritious compost meal for your garden.
- Bin Composting: This compost is put in a bin and turned periodically to allow for decay.

- Worm Composting: You have to buy the worms and then feed them scraps from the cafeteria and they will do all the work and produce beautiful, dark loamy compost for your garden. Red worms of tiger worms are best. You can feed them the food scraps cut up to one inch and they will do the rest of the work. These worms can be found at gardening centers and online.

A successful compost heap has the following qualities:

- It should be a balance of green and dried material with added mixture such as lime to encourage decomposition
- Layers should be no more than six to eight inches deep.
- The moisture content of the heap should be around fifty percent.

"A compost heap is built with the intention of speeding up the rate of decay of the contents by encouraging the activity of a range of bacteria which break down organic matter. A well-made heap is a scene of frantic activity. ."

from the Practical Organic Gardener, by Brenda Little

Sheet Composting (Science 5.10)

This demonstrates a very low labor way to compost that even Kindergardeners can manage with just a little help from adults. There are no devices, no additives, no turning.

1. Designate one garden bed for sheet composting.
2. Dig a trench at one end
3. Day by day fill the trench with fruit and vegetable kitchen waste, egg shells, coffee grounds and weeds
4. Sprinkle on handfuls of soil and hay or leaves to prevent it from getting smelly and to add carbon
5. When the trench is mounded, put the rest of the soil and a layer or straw or hay on top. Move down a bit in your garden area and dig the next shallow trench.
6. Repeat the layering

This is a slower method and might take a year to decompose, but there is no fuss and small children can do this method. The straw will bring you lots of earthworms and workable soil next season. Just plant on top of it!

Games Gardner's Play – The Organic Olympics

Provided by the Stony Brook Millstone Watershed Association

There are five “events” making up the Organic Olympics. This game is used at the Stony Brook Millstone Watershed but can be adapted to fit an assembly or classroom activity.

- **Lunch sorting – trash, recycle, reuse, compost** – Each team must sort their lunch remnants into four categories – trash, recycling, reusable and compost.
- **Preparations** - Students will be told to hold onto their lunches and garbage until told to do otherwise. During lunch they should think about what they will do with any and all leftover materials.
- **Methods** At the conclusion of lunch, each team lines up and through a brief inquiry lesson is told how to sort their leftovers (ie. what is recyclable, what can be composted). The event is conducted in relay fashion with one team member at a time running to the three buckets (trash, recycle, compost) to distribute their leftovers. Two judges (Shed staff) can make note of faulty judgements (ie. discarding a recyclable, or composting trash) and tabulate during the event.
- **Materials** – Compost Guidelines (laminated – 2 per team), compost bucket (5 gallon – 1 per team), garbage bucket (5 gallon – 1 per team), and recycle bucket (one big yellow).
- **Conclusion** – Review the concepts of trash, recycle, reuse and compost. Continue by tabulating points – the winning team (quickest) gets 5 points to begin. Then investigate each teams buckets – each wrongly placed items results in a point for the opposing team. After investigating the buckets, tally points. Then survey who has a reusable lunch container. Add two points for each item reused. Now tabulate the final score for this event.

Plotting and Planting



The following garden plans are designed for the elementary school age children, K-5 but can be adapted for any grade level k-12.

Lasagna Garden (Math 4.4)

A lasagna garden is a raised bed that, just as its name suggests, is built up in layers like a tray of lasagna. The students follow a recipe of layers including several kinds of organic material like grass clippings and soil. This is a nearly foolproof place to get things to grow because the soil conditions are ideal. Lasagna beds lend themselves very easily to cross-subject projects that use a lot of math in the garden.

Directions:

In a garden area of rectangular shape, the students sort out how many beds they will grow and set up a coordinate grid, leaving space for a pathway between each bed. So, for example, they could lay out 6 beds (2 x 3), with each bed having a footprint of 3 feet by 4 feet.

The children use strings and sticks to lay out the grid and pathways, measuring precisely to make sure the strings are parallel and perpendicular.

Because these are raised beds, the children are now working in three dimensions. That means that in addition to depth and width, they can account for height and volume. They will come to understand how to

Our Harvest in the Community

Two Princeton Elementary schools are using their herb gardens to make tea during Colonial days as well as for math, language arts and health and safety classes. These same elementary schools are sharing their bounty with local restaurants. Johnson Park's mint was used in the Bent Spoon Chocolate Mint Gelato served this past summer and the basil, mint and flowers from the Riverside Elementary School Garden were shared with Camillo's Café where they were used in preparation of their meals and to adorn the tables.

make the beds equidistant. The raised beds offer the opportunity to plant in arrays. So for example, the students can plant three rows of basil, with five in each row for a total of 15. More advanced students can add work with cubic inches and feet as well as weight measures, as many of the organic materials like compost or peat moss are sold in cubic measures or by the pound. The lasagna garden obviously offers opportunities for complex problem solving, calculating a budget through word problems, addition, subtraction, multiplication and division.

Coordinate Grid Garden (Math 4.2)

A coordinate grid garden is a living math project that can be planned and planted by Kindergarten through 5th graders and beyond and can satisfy many curricular areas.

A grid garden can contain something for every grade level:

- Kindergarten rainbow garden,
- 2nd grade butterfly garden
- 3rd grade colonial herbs,
- Fourth grade lesson on use of precise language to describe a complex problem or provide direction via the creation of a garden map.
- Fifth graders set up the garden for the younger students to use.

Directions:

The soil should be prepared as laid out earlier in this guide. The children will need strings, sticks and measuring tape. They measure the bed they are to plant. If it is a rectangle, say 8' by 12'. This can be designed on paper as a grid of two foot squares 4x6 each. They set up the sticks every two feet, checking each other's work to make sure the lines will be parallel and perpendicular when they tie the strings around the stick markers. If they measure well, they should come up with 24 squares. They should be labeled A,B,C,D... by 1,2,3,4 etc.

In each square, the students plant a plant according to whatever the theme of that particular patch. Then they prepare a map of the garden or prepare a lesson in identification for visitors. For example, D₂ is the basil, B₄ is the parsley, A-6 is the chives. And so forth. The strings may be left in place to delineate each coordinate.

Herb Gardens

Of course you can plant anything and everything you want in your garden but here is a simple project that can take you from the garden to the classroom to the table and it doesn't require much space at all. Our organization's dream is to someday see an herb garden at every school and a vegetable garden for every school lunch.

An herb garden is very do-able as long as there is a sunny spot at each school.

The following herbs can be planted and used for many activities. Some of these are medicinal and some are for food. (All are safe to eat — they just don't taste very good).

Guide to Herbs: their Origins & Uses (Social Studies 6.4)

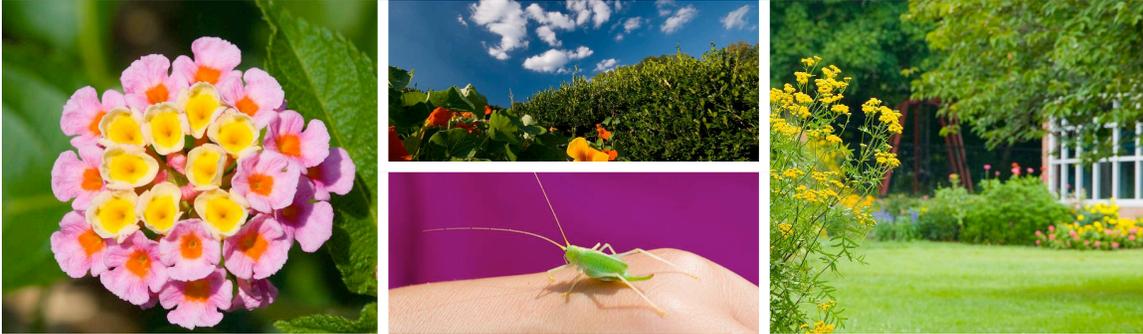
The following herbs are safe to pick, smell, and taste, however, they are not all food. Some have very strong medicinal properties others we use to make pesto or tea and add to our meals. Students should taste only those plants they know are meant to be eaten.



Basil	Middle East	Basil is widely used as a cooking herb, especially in tomato dishes. We use a lot on “Pesto Day”, when fourth graders harvest the herb and salad greens for a feast. Medicinally, it is an excellent digestive system support herb.
Catmint	Europe and Asia	Nepeta or Catmint is here for cats who love its minty smell.
Chives	Europe, North America and China	Chives is used in cooking for its delicate onion flavor. Chives is a traditional Asian remedy for cold and lung congestion.
Dill	Southern Europe and Western Asia	Dill is primarily used as a culinary herb, especially in Scandinavia and Central European cuisine. It has been known to provide digestive aid and was traditionally used in children’s digestive medicines
Garlic Chives	Asia	Garlic chives can be used as you would use regular chives, although they have a garlic flavor. The lovely white flowers are edible. The Chinese used them traditionally to reduce fatigue.
Lavender	Mediterranean	in sachets and as moth repellent.
Lemon Balm <i>a.k.a. Melissa</i>	Mediterranean	The tea made from lemon balm is a great stress reliever. Its medicinal uses also include support for the digestive tract, “winter illnesses”, and strengthening of the immune system.
(Sweet) Marjoram	Southern Europe	Marjoram is cultivated for its aromatic leaves, either green or dry, for culinary purposes; the tops are cut as the plants begin to flower and are dried slowly in the shade. It is related to oregano.
Nasturtiums	South America, especially Peru and Bolivia	The leaves and flowers are edible and may be used for salad or garnish. They have a spicy, radishy flavor.

Origanum	Europe and Central Asia	Oregano is used in tomato dishes, eggs and beans. It is antiseptic, expectorant, aids digestion and muscle spasm. May be taken as a tisane (infusion of fresh leaves).
Parsley (curled leaf)	Northern Europe and Western Asia	Widely eaten and may be made into tea. Parsley is good for the kidneys. It stimulates appetite, reduces fevers, is good for bad breath and scavenges free radicals. At Riverside we plant a lot extra because it is a fodder plant for the black swallowtail butterfly caterpillar.
Peppermint	Europe	Used in many desserts and confections and gum. Helps with indigestion. Peppermint is antispasmodic, anti-inflammatory, antibacterial, antiviral, and anti-fungal. Tea is good for nervous headaches and agitation.
Rosemary	Mediterranean	Used in many desserts and confections and gum. Helps with indigestion. Peppermint is antispasmodic, anti-inflammatory, antibacterial, antiviral, and anti-fungal. Tea is good for nervous headaches and agitation.
Sage	Southern Europe	A key ingredient in herb stuffing at Thanksgiving time. Sage was used to kill cold and flu germs, may be used as a gargle. It is preservative, anti-fungal, anti-inflammatory. The leaves may be used fresh or dried for tea.
Sorrel	Europe and Asia	Bitter and sour, sorrel has been used as a diuretic, laxative and antiseptic. The young leaf is edible and prized for its lemony tang in salad; it is used by the French for soup. Sorrel is meant to be eaten in small quantities.
Tarragon	Southern Europe	Widely used as flavoring for salads, steak, fish, herb butters, vinegar and especially chicken.
Thyme	Mediterranean	Widely used in cooking for tomato dishes, thyme is delicious in stews and chowders. It is used medicinally for cough and congestion. Thyme is anti-inflammatory, anti-bacterial, and anti-viral. Its oil is used in modern day European hospitals for cleaning. Thyme improves digestion and relaxes muscles. The dried flowers and leaves may be used as tea.

Lesson Plans



Lesson Plan – Seed Dispersal Puppet Show: Pre-school

Debrief: Show different characters and review how they traveled.

Outside:

- Let's look for seeds! Go for a walk. Try some of the following things:
- Release Dogbane and/or Milkweed seeds – watch them fly
- Open up seed pods
- Plant seeds (if the ground is not frozen)
- Find “hitchhiking seeds” – Agrimony, Queen Anne’s Lace, Trick Trefoil. Take them back and put under the video microscope (if time allows) or use magnifying glass to look at them.
- When you find a seed, try to find the grown-up plant
- Look for evidence that animals have been eating seeds. Discuss which animals eat seeds.
- Collect different types of seeds before program. Give each child a seed to search for.

Back inside.

- Look at hitchhiking seeds under the video microscope. Seeds are good for eating too. Who eats seeds? (Birds, squirrels, deer, mice, people) – Let’s eat some seeds: sunflower seeds and pop-corn for snack

Craft:

Seed Mosaic: Use coloring sheet, and instead of coloring it with crayons, glue on different colored coconut and beans to create color. Or, give them a blank sheet of paper and have them create their own design. Use different colors of food coloring to color coconut ahead of time.

- Shredded coconut
- Food coloring
- Zip loc bags (for coloring coconut)
- Beans-kidney, black, split peas
- Glue
- Coloring page/paper

Seed bed in a bag – show the one that is (hopefully) growing. Note: start 3 weeks prior to first program. Have each preschooler create his or her own to watch them grow.

- Quart baggies
- Paper towels
- Spray bottles
- Seed mix – pumpkin, corn, bean, watermelon

Note: Fold towels first, place in bag, then spray (towel should be damp), place seeds and seal.

Coloring sheet: Little Sprout seed books

- Photocopies
- Staplers
- Crayons

References:

- Hands on Nature – Seed Dispersal: Ingenious Ways to Get Around – p135
- Lou Beck – usually has milkweed seed hanging about
- www.preschooleducation.com - garden section

Lesson Plan – Super Seeds for Preschool

Provided by Stony Brook Millstone Watershed, Pennington, New Jersey

Audience: Ages 3-5;

Objectives:

- Identify that seeds are how new plants grow
- Identify the needs of a seed – soil, sun, water, and air
- Identify that there are many different types of seeds
- Identify that seeds come in different shapes and sizes
- Experience how different seeds get around to new places
- Learn that seeds are food for animals and people

Materials:

- Various seeds for show: coconut, pumpkin seed, acorn, apple
- Seed for eats: sunflower and popcorn
- Puppets for theater
- Pictures of seed, sun, water, air, soil,

Wildflower Songs

Relaxing Flowers

Tune: “The Itsy Bitsy Spider”

Five little flowers standing in the sun
 (Hold up five fingers.)
 See their heads nodding, bowing one by one?
 (Bend fingers several times.)
 Down, down, down comes the gentle rain
 (raise hands, wiggle fingers and lower arms to simulate falling rain)
 And the five little flowers lift their heads up again!
 (Hold up five fingers.)

Flowers

Tune: “Pop! Goes the Weasel!”

All around the forest ground
 There’s flowers everywhere.
 There’s pink, yellow, and purple too.
 Here’s one for you.

I’m a Little Daisy

Tune: “I’m a Little Teapot”

I’m a little daisy
 Tall and slim (Stand on tiptoes.)
 Here are my petals (Place hands on side of head and wiggle fingers.)
 Here is my stem. (Hold arms down at sides of legs.)
 When the sun comes up (Make sun with arms.)
 And the rain comes down (Flutter hands)

tree, and flower

- Milkweed/Dogbane/Cattail seeds to disperse
- Magnifying glass
- Pre-collected Queen Anne's lace seeds for microscope

Introduction:

Welcome the group and have everyone go around and say their name and favorite tree, flower, or any plant they like.

Today's program is about something very special and important. Show pictures of a tree, flower, and bush. What is the same about all of them? They are all plants. In order to have a plant – a flower or tree, what do you need to start with? Seed! Put picture of seed on the magnetic board. Now what does this seed need to grow? Water, soil, air and sun! (Put pictures of these on the board as they say them.) If the seed has all of these, then it can grow into a beautiful flower or tall tree. (Put pictures of flower and tree on magnetic board.)

Song:

I'll Plant A Little Seed (Sung to: "I'm A Little Teapot")

I'll plant a little seed in the dark, dark ground.

Out comes the yellow sun, big and round.

Down comes the cool rain, soft and slow.

Up comes the little seed, grow, grow, grow!

(Use different movements for sun and rain, etc.)

Now what do seeds look like? (See what they say) Are all the seeds the same? Do they all look the same? Are they all the same color? Seeds come in different shapes and sizes. (Pass around different types of seeds to show them. Include pumpkin seeds, coconut, beans, cattail, acorn, etc. Also, pass around magnifying glasses for use.) You can also show pictures of different seeds from the book, *Seeds* by Ken Robins. These will all grow to become plants.

Before a seed can grow into a plant, it needs a special place. Does anyone have a special place that they like to go? Does mom or dad have special places? How do you (sometimes) get to your special place? Travel by car, plane, train etc. Well seeds have to travel to get to special places to grow. Let's watch a puppet show to see how seeds travel.

Lesson Plans – Kindergarten Activities

These lessons are linked to the following curricular standards: Science 5.5, 5.8, 5.10 Language Arts 3.2, Health 2.1, Visual and Performing Arts 1.1, Social Studies 6.4 .

The following garden activities can be related to the kindergarten science curriculum:

1. Observe Japanese Beetle grubs can be observed in the egg stage
2. Plant peas and beans in the Springtime. These have large seeds and are easily handled by Kindergarten students and sweet peas can be harvested in May and June.
3. Compost apple cores or peels from fruits and vegetables. (see compost section)
4. Keep a weather journal tied to the growth of the garden.
5. Identify Edible Plants: What senses do you use to identify plants and decide if they are safe to eat. Once children are able to identify edible herbs such as parsley and chive, they may be able to go to the garden on their own.
6. Collect seeds in the fall and dry for the spring planting.
7. Decorate small vases and plant with seeds or plants to take home on Mother’s Day.

Lesson Plan – Seedbed in a Bag: (Grade 1)

Provided by Stony Brook Millstone Watershed, Pennington, New Jersey

Kids can make their own miniature plastic bag greenhouses and watch the processes that are usually mysterious underground phenomena.

Materials:

- plastic closable bags,
- Paper towels,
- Seeds (beans, radish, peas, etc.)

What to do:

- Place a damp paper towel in each bag.

- Put some seeds into each bag – various kinds in separate rows or different kinds in different bags. Lock the bag.
- Use masking tape to mark each bag with the gardener’s name and the kind of seeds.
- Arrange the bags on a shelf or tape to the bottom of window shades or blinds for observation. Place where the heat is as close to 70 degrees as possible.
- Watch to see which seeds sprout first and check daily on how they grow. There’s no need to re-water the toweeling if the bags are locked shut. The toweeling will stay moist and the seeds will grow in about 3 weeks. Seedling can then be transplanted to soil.

From *Hug a Tree* activity guide

Lesson Plan: Pumpkins (Kindergarten - 1st)

By Lynda Boddin, Garden Educator, Johnson Park Elementary School

Lesson plan goals:

- Science: the child will be able to recognize the plant life cycle
- Language Arts: the child will be able to correctly sequence a story

Activities:

- Shared reading of Pumpkin, Pumpkin by Jeanne Titherington
- Students create a model of the pumpkin cycle. (I did one model and we discussed it together)
- Staple two paper plates together, leaving the top section unstapled. Decorate like a jack-o-lantern. Attach a piece of yarn to the pumpkin. Attach pictures to the yarn that represent each of the steps leading up to the jack-o-lantern. The “vine” can be stuffed inside the pumpkin and gradually pulled out as students retell the Pumpkin, Pumpkin story, or recite the steps of the pumpkin lifecycle.

Resources:

- Pumpkin, Pumpkin by Jeanne Titherington
- Pumpkin life cycle sheet, paper plates

- Pumpkins

Enrichment:

- Take a field trip to a pumpkin patch. Recall events or use pictures from the field trip to sequence.

Plant pumpkin seeds:

- Place in plastic bag with wet paper towel until they sprout, then place in soil. Keep track of and sequence steps

Lesson Plan – Rainbow Garden (Grade 1)

by Kirsten Fenton, Riverside Elementary School, First Grade Teacher

This lesson links to the following curricular standards: Science 5.7, Language Arts 3.1, 3.2, 3.5 Math 4.1, 4.4, Visual and Performing Arts 1.2

It has become a first grade tradition each Spring to plant a rainbow of colorful flowers and plants hence the name, *The Rainbow Garden*. As a result, we make quite a few connections to this activity in the areas of music, math, language arts and, of course, science.

Although Plant Parts and Functions is the most obvious, we are past that unit by the time we plant. We revisit basic concepts learned in that unit.

The first graders study light, shadows and color in the winter. So, we connect the colors of the rainbow in the garden project to what we learned doing labs involving prisms and making rainbows by means of a wide range of experiments.

Below are some additional Integrated Curriculum Activities to go along with this wonderful garden project.

Literature Connection:

- *The Reason For a Flower, by Ruth Heller* – This award winning author addresses the reason for a flowers and weeds, as she skillfully reveals that there is so much more involved in the development of plants.

Writing:

- Encourage students to create stories in writing workshop incorporating what they know about plants and flowers into either fiction or non-fiction books.

Math Connections:

- These math problems involve adding, subtracting, area and multiplication, depending on how the student interprets the question or the method used to solve them. Each year the problems will change as will the number of flowers planted and students involved.

Examples:

1. On Tuesday, we planted 28 flowers in the rainbow garden. After each of the 18 students planted one, how many still needed to be planted? *Show how you know in pictures, numbers and words.*
2. Each 1st grade class was going to plant 28 flowers. How many flowers would the first grade plant in all? *Show how you know in pictures, numbers and words.*
3. We planted 7 rows of 4 flowers, which equaled 28 flowers. How else could we have arranged the flowers to equal the same amount in each row? *Show how you know in pictures, numbers and words.*

Music:

- We also sing *I Can Sing A Rainbow*

Red and yellow
Pink and green
Purple and orange and blue
I can sing a rainbow
Sing a rainbow
Sing a rainbow with you
And you and you

Lesson Plan: Seed Sort (Grade 1)

by Kirsten Fenton, Riverside Elementary School

This lesson links to the following curricular standards: Science 5.1, Math 4.1, 4.2, 4.3, 4.4, 4.5 Science 5.1, 5.5, 5.6 Language Arts 3.1

This lesson is part of our science unit *Plant Parts and Plant Functions*, which encourages the exploration of plant parts, how they work, and the observation of various types of plant growth. It involves collecting seeds in the fall from the organic garden and drying over the winter months for use in this activity in the spring.

This lesson, although it must be built upon, encourages the use of a variety of math skills such as counting, estimating and eventually, as seeds are planted and growth can be observed, measurement. In addition, students will use some of the essential science process skills, which will include sorting and classifying, observing, recording and comparing data. This lesson is one that I plan to build on over the next few weeks as we observe plant growth from the various seeds and pay particularly close attention to the following:

- Students will attempt to identify which plant comes from which seed (I will reveal the truth after this activity.) Math 4.5. LA 3.1
- Which seed sprouted first?
- Which plant has the longest leaves?

In addition, students have collected and observed the various ways seeds travel in nature from the parent plant. Student will engage in discussions pertaining to the reasons for seed dispersal in nature in relation to survival.

Cognitive Objectives:

Students will think about the following questions: LA 3.1

- How are seeds alike?
- How are they different?

Behavioral Objectives: Science 5.5. LA 3.1

- Some students will participate in discussion pertaining to the question: How are plants the same? How are they different?

- Students will count seeds. Math 4.1
- Students will sort seeds. Science 5.6
- Students will estimate. Math 4.1
- Students will compare. Math 4.5
- Students will record data. Math 4.4

Procedure:

1. Students will gather on the floor and the following questions will be asked: How are seeds the same? How are they different?
2. Some students will participate in class discussion.
3. A dilemma will be posed: I have a bunch of seeds in this cup; I want to know how many of each kind of seed I have. Can anyone think of a way that we could solve this problem?
4. Following student discussion, I will review: sorting, graphing and estimating.
5. Students will be asked to return to their seat and materials will be passed out.
6. Student will engage in the activity.

Those who successfully complete the task will have the option of going to another table to observe seeds with a magnifying glass and record their findings.

Materials:

- 5 types of seeds
- plastic bags (18)
- scales (at least 4)
- recording sheets
- plastic teddy bears (4 medium size)

Assessment:

- Prior to the independent activity, students will share their thoughts in a group, thus allowing the instructor to assess their background knowledge and interpret their understanding of the task.

- During the lesson the instructor will check in with students and ask pertinent questions which will ensure that they are “on task”.
- Their recording sheets, which will display their ability to count, sort, record and compare data will be collected and reviewed to determine which students need re-teaching in any of the concepts or if additional challenges are appropriate for certain children in future lesson.

Culminating Activities To Be Done At A Later Date:

- One of each seed will be planted for the purpose of observation. Plants can later be transplanted from cups into the organic garden.
- Students will also: attempt to identify which plant comes from which seed (I will reveal the truth after this activity.), predict which seed will sprout first,
- And determine which plant has the longest leaves?

Materials:

- 5 types of seeds
- soil
- cups
- grow lamps

SAMPLE WORKSHEET
Sorting Seeds: How many?

Name _____

I estimate _____ I counted _____

Lesson Plan – Seeds Travel (Grade 1)

by Kirsten Fenton, Riverside Elementary School, First Grade Teacher

Science 5.1, 5.3, 5.5, 5.6, Math 4.2, Language Arts 3.5

Curriculum Connection:

- 1st grade Plant Parts and Functions
- Biological Science: Seed Dispersal

Objectives:

- Students will observe many ways seeds travel from the parent plant. Students will collect a variety of seeds.

Science Process Skills:

- Observing
- Recording
- Sorting
- Classifying

Procedure:

- Prior to lesson: *Read Dandelion Adventures* by Patricia Kitz and show video *Seeds Scatter* (SVE and Churchill) to give student necessary background information.

Review:

- Seeds cannot travel by themselves. They must be carried away from parent plant so they have enough light and space to grow.

Lesson Plan – The Expanding Butterfly Garden (Grade 2)

By Dorothy Mullen, Garden Based Educator

Science 5-5

A butterfly garden emphasizes host plant (for the caterpillar stage) and nectar plants (for the butterfly stage).

Second graders learn the life cycle of butterflies using black swallowtails and monarchs. You will find fennel, parsley and Queen Anne’s Lace for the swallowtails and numerous kinds of asclepias for monarchs to lay their eggs. For instance, you can put in spicebush and pipevine for spicebush and pipevine swallow-tails.

You can also plant meadow flowers and grasses that host butterflies.

Colorful nectar flowers include Lantana, Heliotrope, Cosmos, Coreopsis, Echniacea (Purple cone Flower), Joe Pye Weed, Rudbeckia, Liatris, Buddlea, Salvia, and Zinnias. At the back, of the garden where there may be more shade put native plants that are less flashy but critical because many butterflies will lay their eggs on only one or two kinds of native plant which their caterpillars eat. As butterflies, they are far less picky, they nectar happily on flowers from all over the world.

Lesson Plan – Potato Plants and the Stone Fox (Grade 3)

Language Arts 3.4

Third graders plant potatoes in the spring. The next fall, third graders harvest, bake and eat them when they read the book Stone Fox.

You could also have second graders plant them to harvest when they reach third grade.

Lesson Plan – Heirloom Seeds: Cherokee Trail of Tears (Grade 4)

Social Studies 6.4

Heirloom seeds are seeds that come from a place we can identify and they have a story. One that provides a great lesson for fourth graders is the Cherokee Trail of Tears. It is a green bean that matures into a dry bean. The beans were carried by the Cherokee tribe during the forced march to Oklahoma in 1838 and

are the botanical ancestors of the beans we plant today. They are pole beans, which means they form long vines that climb.

These beans can be planted in early spring and mature in the early summer. If the students miss these beans, they can be picked and kept for fall when the students return to school.

Lesson Plan – Immigration Unit (Grade 4)

by Dorothy Mullen, Garden-based educator,

Social Studies 6.3

Where did foods originally come from? The place that has the greatest diversity of a plants is credited with being the place where it probably started.

There are eight main centers in the world.

Place seeds or pictures of food or real food on a map to reflect where it originated then discuss how the seeds, plants, flowers or fruits might have made it to our grocery stores.

Apples — Kazakstan

- Blueberries — United States
- Carrots — Afghanistan
- Corn (maize) — Central America
- Cranberries — United States
- Pecans — United States
- Potatoes — Peru
- Sunflowers — United States
- Tomatoes — Central America
- Watermelon — Africa

Resources

Seedfolks by Paul Fleschman

Inside the Secret Garden “A Treasury of Crafts, Recipes, and Activities”

By Carolyn Strom Collins and Christina Wyss Eriksson

Slugs Bugs and Salamanders “Discovering Animals in Your Garden”

By Sally Kneidel

Lesson Plan – Seed Order (Grade 4)

This lesson is linked to curriculum standards Math 4.1.

Materials:

- A garden plan
- Seed catalogues
- Order forms
- Calculators

Activities:

Once a decision has been made about what is going to be planted, students can:

- Find seeds in catalogues and compare prices
- Decide how many packets of each kind of seeds will be needed to plant in that size space (read descriptions)
- Fill out order form
- Calculate shipping amount
- Add totals

This can also be done within a budget so students have to decide if there is enough money for all the seeds or extra money leftover.

Lesson Plan – American Flag Grid Project (Grade 5)

This lesson is linked to curricular standard Math 4.2.

Plant an approximation of the American flag. The flag will consist of a 4 x 8 grid of red, white and blue flowers approximating the American Flag.

The concepts and vocabulary we used to design the bed are as follows:

- Coordinate
- Rectangle
- Square
- Intersecting lines
- Array
- Perimeter
- Feet and inches
- Area
- Unit
- Graph
- Width
- Length
- Grid
- Perpendicular
- Parallel
- Equidistance

It was laid out with string and a yardstick.

Lesson Plan – Precise Language Writing Activity (Grade 5)

This lesson is linked to curricular standard Language Arts 3.2.

One person demonstrates the correct procedure for cutting and tying small bunches of herbs.

The students watch and then wrote simple notes on oaktag. Oaktag worked well outside because they didn't need to lean on a hard surface.

When you return to the classroom, a student can read his/her notes and another can act it out. Quickly they realize that if steps were missing the task could not be completed.

The whole class then helps add the missing steps from the notes. In some cases, the steps were complete but the word choice was too vague. The whole class supports the note taker in making appropriate revisions.

Recipes



A Lesson in Legumes (Health 2.1, Nutrition, Math 4.2 Measurement)

Legumes are the vegetables you think of as beans and peas. They include plants that have seed pods that split along both sides when they are ripe. They contain protein, fiber and B Vitamins and are low in fat. Sometimes we buy them dry. In this case, we soak them first overnight and then cook them. Sometimes, like today, we buy them already cooked in cans. They are inexpensive and very nutritious. Today we will make two recipes for dips. You can dip vegetables and enjoy the healthy snack.

This lesson is adapted from Food is Elementary, by Antonia Demas

Job List

Form groups. Each group will:

- Record recipes
- Mash beans
- Juice lemons
- Chop or mince vegetables for the dip
- Crush garlic
- Measure other ingredients
- Mix
- Cut up bread and vegetables

Materials Needed

- Bowls for mixing
- Forks for mashing

Certified Experts

Grades 3-5

- Students are trained and certified to identify plants and know which can be eaten
- These students then become guides and take classes into the garden to teach what they have learned.

- Lemon squeezer
- Knives
- Cutting board
- Spoon for mixing
- Garlic press
- Bowls for serving
- Napkins (preferably re-usable cotton napkins)
- Can opener

Activities

- Identify how our families use legumes
- Record the recipes to make at home
- Talk about what you do and don't like about these foods
- Identify what you would be willing to try
- Make artwork out of legumes. Label the ones you recognize and record the information about these plants
- In the spring, plant seeds and grow your own beans and peas. You can eat beans young and green or older and dried.

Recipes

Hummus

Ingredients:

- 1 can of chickpeas
- ½ cup tahini paste
- 1/8 cup olive oil
- 1 lemon, juiced
- 2 cloves garlic, crushed
- Salt to taste
- ½ cup chopped parsley

What to Dip:

- Cup up pita bread
- Choose an array of raw vegetables

How to make it:

- Drain the chickpeas
- Mash them with a fork
- Add the remaining ingredients and mix well

Black Bean Dip

Ingredients:

- 1 can of black beans

- 2 diced tomatoes (preferably from your garden!)
- 3 finely chopped scallions
- ½ cup chopped parsley
- Salt to taste
- 1 lemon juiced

To dip:

- Cut up pita bread
- Raw vegetables

How to make it:

- Drain the beans
- Mash them with a fork
- Add the remaining ingredients and mix well

You can also make, Pesto for Summer, Beans in Spring, Salsa in Fall

Field Trips

Field Trip to Local Organic Farms

Stony Brook – Millstone Watershed Association

Suitable for 5th - 8th Grades.

Whether you are teaching your students about farming, food production, food chains, or sound environmental practices, learning the basics of organic farming can be a great way to illustrate these concepts. Through this unique program, students will learn about the Watershed Organic Farm located in Pennington, New Jersey. The organic farm currently serves 900 families from the area and is one of the largest in the Northeast.



We begin the program with an introduction and a game about food chains to help students understand why organic farming is so important. The students then visit the greenhouse, compost pile, and the productive fields. During the visit, students will test the soil for vital nutrients, look at weeds and their affect on the crops, examine insects to ascertain whether they are beneficial or harmful, and dig in the compost pile while learning the importance of composting and the decomposer food chain. The program will culminate with the running of the Organic Olympics that will tie together the concepts learned throughout the day.

This program is suitable for students in 5th-8th grade and meets several of the NJ Core Curriculum Standards. For more information or to schedule a program, please contact Rick Lear, Program Coordinator (609) 737-7592.

Local Organic Farm

Cherry Grover Farm

Suitable for Kindergarten - 8th



Teachers, looking for an opportunity to get your students off the computer and “back to basics” through an understanding of life on the farm? Come on out to the farm! Explore how we take care of our animals and work in cooperation with their natural system to produce our meat and dairy products. Meet the cows, pigs, sheep and chickens of Cherry Grove, join us for milking in the barn, and learn how to make cheese. Give us a call today to schedule a tour for your school or neighborhood group.

Cherry Grove Farm, 3200 Lawrenceville Road, Lawrenceville, New Jersey 08648,

Phone: 609-219-0053 and ask for Megan Caley or Kelly Harding. email at cherrygrovefarm@verizon.net or on the web at www.cherrygrovefarm.com.

Organic Grocery Store

Whole Earth Center

Princeton, New Jersey



Have you ever wondered why organic food is good for us? Curious what a pomegranate or kohlrabi is?

Whole Earth Center close to downtown Princeton will provide a tour to k-12 grade students. The tour offers an opportunity for students to grind their own peanut butter from fresh peanuts and discuss why natural foods are good for us. Students will also read and compare food labels, learn the ingredients that go into a healthy lunch and about medicinal herbs.

Contact: Jennifer Murray, Manager Whole Earth Center 609-924-7429 or Fran McManus, Whole Earth Center, 921-0835.

Curricular Links

Now that we have laid the groundwork for your garden we want to make the links to the classroom. When possible, we have linked activities to grade level as well as to the New Jersey State standards for classroom education. The following is a sampler of curricular areas and activities that garden based education can address and the appropriate grade levels.

Science 5.5 & 5.8

1. What do plants need to grow? K and 1
2. Life cycles of plants – K and 1
3. Identify parts of a plant – Grade 1
4. Function of parts – Grade 5
5. Seasonal changes – Grade 1

Measuring Plant Growth – Math 4.2

6. Measure with non-standard items (cubes and paper clips)
7. Measure with rulers inches and centimeters
8. Chart the growth (+, -, <, >)
9. Graph the growth

Trimming and Weeding – Math 4.1

10. Estimation K-5
 - a) Count number of weeds pulled in a 2 inch square
 - b) Using multiplication or repeated addition – grade 3
 - c) Estimate the number of weeds that will be pulled from a pre-measured section (8 inch square) or the whole herb garden.
11. Compare different herbs – do some have more weeds or less? K and 1

Health and Safety – Science 5.5 Math 4.3

12. Use senses to identify plants
13. Recognize/classify plants by sight and smell – Science K and 1
14. Species of Plants – Science Grade 5
15. Use leaves and seeds to identify the plants
16. Classify all that belong to the large mint family by observing and finding the square cross-section

Tasting – Math 4.3

17. Distinguish between safe to eat and what you want to eat it
18. Take a survey – Math K-5
19. Collect and analyze data
20. Chart/graph/compare favorites to eat by class or grade level
21. Venn diagram or chart

Flowers (flowers are safe and edible but maybe not delicious)

22. Describe –Language Arts K-5
23. Compare/Classify similarities and differences – Math K-5

Interdependence of organisms – Science Grade 5

24. Pollination — bees love this garden — honey bees, bumble bees
25. Beneficial wasps eat other insects
26. Black Swallow Tail butterflies and caterpillars are attracted to the garden – Grade 2

Herb Uses: Around the Globe and Back in Time – Social Studies K-5

27. Research what these herbs were used for in Colonial times and how they are used now:
28. Research the origins of herbs and plants and report on this.

Cooking Ideas: All

29. Pick rub and dry herbs first
30. Use basil and oregano to make pizza muffins or pizza
31. Sage for Thanksgiving cornbread and stuffing
32. Combine peppermint and lemon balm for a calming tea

Index for Curricular Standards

The following index summarizes how the chapter and lesson plans link to the New Jersey State Curricular Standards.

Chapter	Curriculum Standard(s)
Planning Your Garden	Career Education and Consumer Family and Life Skills
Herb Gardens	Social Studies 6.4
Composting	Science 5.10
Plotting and Planting	Math 4.2, 4.4 / Science 5.4
Recipes	Health 2.1 / Math 4.2
Lesson Plans	Math 4.1,4.4 / Science 5.1, 5.3, 5.5, 5.6,5.7, 5.8, / Social Studies 6.3,/Language Arts, 3.1,3.2,3.4,3.5./ Science 5.1, 5.3,5.5,5.6,5.8,/Visual and Performing Arts, 1.1,1.2/Health, 2.1

Grade(s)	Lesson Plan or Activity	Curricular Standard
k-5	American Flag	Math 4.2
k-5	Behavior and life sciences of animals	Science 5.5
2	Butterfly Garden	Science 5.5
k,2,5	Components of Weather	Science 5.8 / Math 4.5
k-5	Compost	Science 5.10
k,2,5	Construct an instrument for measurement	Science 5.3
k-5	Decorate vases and plant with seeds	Visual Arts & Performing Arts / Social Studies 6.4
k-5	Describe objects pictorially and verbally	Math 4.2 / Language Arts 3.2

Grade(s)	Lesson Plan or Activity	Curricular Standard
k,2,5	Describe Weather	Science 5.8
k,2,5	Explain effects of weather	Science 5.8
3	Heirloom Seeds	Social Studies 6.4
k-5	Identify Edible Plants	Language Arts 3.2 / Health 2.1
k-5	Identify observe objects	Science 5.1
4	Immigration Unit	Social Studies 6.3
k-5	Investigate re: physical properties	Visual and Performing Arts 1.3 / Math 4.2 / Language Arts 3.1
k,1	Investigate/sequence objects	Science 5.1
k-5	Observe and Record Data	Math 4.2 / Science 5.8 / Math 4.2
k	Observe Japanese Beetles	Science 5.5
k-5	Planting peas	Science 5.8
k-5	Potato Plants	Language Arts 3.4
3,4,5	Precise Language	Language Arts 3.2
k	Properties of Matter	Science 5.1
k,1	Rainbow Garden	Science 5.7 / Language arts 3.1, 3.2, 3.5 / Math 4.1, 4.4 / Visual and Performing Arts 1.2
3,4,5	Seed Order	Math 4.1
k,1	Seed Sort	Math 4.1, 4.2, 4.3, 4.4, 4.5 Language Arts 3.1 / Science 5.1, 5.5, 5.6
k-5	Seeds Travel	Science 5.1, 5.3, 5.5, 5.6, Math 4.2, Language Arts 3.5
k-2	Separate objects	Math 4.2
k-5	Use non-standard units of measurement	Math 4.2
k,2,5	Weather Journal	Science 5.8

Curriculum Standards

Behavior and Life Cycles of a Common Animal: Science 5.5

- I. 1. Compare and contrast living and non-living things.
2. Identify the basic requirements of living things.
3. Explain that living things have different levels of organization
4. Identify and discuss life cycles of organisms
5. Discuss and give examples that explain how organisms relate to the environment.
6. Explain that living organisms can be sorted (classified) into groups on the basis of similarity in appearance and behavior.
7. Supply evidence that many different kind of plants and animals (species) live on earth today (diversity)
8. State evidence showing that individuals vary within every species.
9. Illustrate that animals are composed of different parts serving different purposes and working together (interrelatedness) for the well begin of the organism
10. Identify the role of animals in an ecosystem.
- II. 1. Recognize the dependence of living things on their environment.

Suggested resources include:

- FOSS Kit: Animals Two by Two

Seed & Plant Growth: Science 5.5

All of the following can be accomplished in your school's garden

- I. 1. Compare and contrast living and non-living things
2. Identify the basic requirements of living things

3. Identify and discuss life cycles of plants
4. Identify a seed and its stages of growth
5. Explain the materials and conditions necessary for plant growth and development
6. Experiment with different types of seeds/plants being grown in different environments
7. Investigate and understand that living things change as they grow and need food, weather and air to survive.
8. Identify the role of plants in an ecosystem.
9. Illustrate that plants are composed of different parts serving different purposes and working together (interrelatedness)
10. Explain that living organisms can be sorted (classified) into groups on the basis of similarity in appearance and behavior.
11. Recognize the dependence of living things on their environment
12. Describe how meeting basic human needs effect the environment
13. Defend the need to care for, respect, and protect living things

Properties of Matter (Objects)

This lesson plan links to the following curriculum standards: Science 5.1, 5.6, Math 4.2, 4.3 4.4, Social Studies 6.6, Language Arts 3.1, 3.2, Visual Arts 1.3

Structure of Matter

1. Recognize that matter can exist as a solid, liquid or gas.
2. Recognize that matter can exist in three basic states and can be transformed from one state to another.
3. Identify by direct observations that basic properties of objects.
4. Observe differences in physical properties using the senses and simple instruments to enhance observation (magnifying glass).
5. Investigate a set of objects sequenced according to size.
6. Separate a set of objects in two groups on a single physical attribute.

7. Predict an unseen member in a sequence of objects.
8. Use non-standard units of measure for common objects.
9. Describe objects pictorially and verbally
10. Recognize unusual or unexpected results in an activity.
- II. Investigate and understand that objects can be described in terms of their physical properties:
 - a) Eight basic colors
 - b) Shapes (circle, triangle, square) and forms (flexible, stiff, straight, curved)
 - Textures and feel (rough, smooth, hard, soft)
 - Relative size and weight (big, little, large, small, heavy light, wide, thin, long, short)
 - Position and speed (over, under, in, out, above, below, left right, fast, slow)

Components of Weather: Science 5.3, 5.8, Math 4.2, 4.5

1. Observe and record data
 - Use a thermometer to measure air temperature
 - Observe, illustrate and record cloud patterns.
 - Take weather measurements (barometer, thermometer)
 - Construct an instrument for obtaining measurements and collecting data about weather (rain gauge, snow measurement)
2. Describe Weather
 - Describe weather changes that occur from day to day
 - Describe weather changes that occur with the seasons
3. Explain the effects of weather
 - Illustrate how living things adapt to the seasonal change of the weather
 - Investigate the relationship between cloud formations and weather

- Suggest why understanding weather is important
- Describe some effects of weather on agriculture
- Show how weather affects our daily lives.

Suggested Resources:

- Kit: Balls and Ramps

Resources

This page is under construction. To be filled in the next installment with school garden resources such as books, websites and more that may be of help in your classroom and garden.

As soon as it is complete, we will send it out to each school for teachers to add to their garden curriculum binder.