



# UNH Growing a Green Generation

## A curriculum of gardening activities for preschool and Kindergarten children

Dot Perkins, Cami Esmel, Lindsay Boyer,  
Dr. Rosanna Freye and Dr. Paul Fisher

Department of Plant Biology & Child Study and Development Center  
University of New Hampshire

Funded by the Anna and Raymond Tuttle Environmental Horticulture Fund  
February 2006

# UNH Growing a Green Generation

A first step into the wonder of plant life.



# Contents

Preface

Introduction

How to Use This Book

Explanation of symbols

Table of contents

## Sections

1. Plant Basics

2. Garden Basics

3. Garden Themes

4. Experiments

5. Nature

6. Arts and Crafts

7. Games and Songs

8. Trips

9. Snacks

I. Useful Tables

II. Reference Section

III. Available Resources



# Preface

**UNH Growing a Green Generation** was started as a collaboration between the Department of Plant Biology and the Child Study and Development Center at the University of New Hampshire. We are supported by the Anna and Raymond Tuttle Environmental Horticulture Fund and StandUp Gardens, Inc. of New Hampshire.

In the spring of 2000, undergraduate students Laura Broderick, Tracie Smith and Maria Sorrento initiated gardening activities with children at CSDC using indoor container gardens. They also developed some class plans.



During the summers of 2000 and 2001, Cami Esmel, an undergraduate student in Environmental Horticulture took the lead in the project. With the help of John McLean the UNH farm manager; knowledge learned in the classroom and from working in the horticulture industry, Cami worked with about 150 preschool children to create a wonderful garden.

Using advice from teachers at the CSDC, Cami and Dr. Rosanna Freyre expanded the project by developing a curriculum of activities for preschool children on gardening and nature: The curriculum was first tested and refined in the summer of 2002 by teaching student Lindsay Boyer, and UNH Cooperative Extension; Ag resources Coordinator, Dot Perkins. Dot continued to refine and test the curriculum in the summers of 2003 & 2004. The resulting work, **UNH Growing a Green Generation** series, was peer reviewed by the teachers at the CSDC in Durham and the Child and Family Development Center at the New Hampshire Technical Institute in Concord. We hope you and the children around you enjoy these activities!



Rosanna Freyre and Paul Fisher  
Dept. Plant Biology, UNH

# Introduction

Our lives are constantly changing, and lately I have focused on the many things that affected me as I grew up. How to grow plants was only one in the many lessons that many wonderful adults passed on to me. When I was approached to work on this project in the summer of 2002, I tackled the task by looking back into my childhood. I thought about all the things I loved about gardening, and all the things I hated. As I looked back on how I learned and how this information was passed on to me, I realized just how much we as adults shape the future of our children in an unconscious fashion. I realized just how true the old adage "we learn by example" is. For instance, how did you learned to peel a potato, fry a hamburger, drive a car, or plant a seed? If you were like me, countless hours of learning was accomplished by just watching an adult do the job while you probably conversed about something entirely unrelated to the act taking place in front of your eyes. Every once in a while you probably asked a question, and it was answered as the task at hand continued. At some point, you reached out and attempted the task yourself and, voila! You could do it. Some of my fondest memories were just being with the adults I loved. Joining their activities at what ever level I could manage for my age gave me a great sense of accomplishment; a feeling of being a part of something important. In addition to the adults in my life, the next thing that stood out in my mind that helped solidify my closeness and devotion to the natural world was just the constant spontaneous interaction with the wonderments in everything. By this I mean, I loved the sizes, shapes, colors, textures, smells, and the overall ways these things interacted with my senses. The experiences of hiding in the corn, crawling under and over, looking at stuff under rocks and boards, building fairy houses out of sticks and stones, tomato fights, and having the opportunities to pretend, all contributed to my positive attitude about gardens, plants and nature. There is no doubt that the adults and natural experiences I was exposed to grew the next green generation my family. All these interactions helped me evaluated and modify the pages in this book to help you foster the same fond, lasting positive relationships and memories in the children and with the children you choose to garden with. I beseech you to teach them an appreciation and awareness of our environment so they will take care of our world. If it is true that we learn by example, they in turn will ensure our future and grow the next green generation.

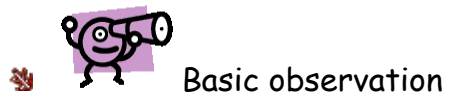
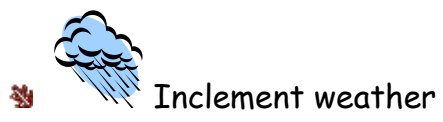
*Dot Perkins*

# How to Use this Book

Easy to recognize symbols have been placed in the table of contents and also at the top of each lesson in each of the 9 sections to provide an, at a glance reference to the scholastic skills, and basic plant knowledge contained within. Words have been highlighted within the text of each lesson. Those highlighted words can be found in a convenient end of lesson glossary. The glossary is provided to simplify the teaching process and help those with limited plant knowledge. In addition, this book also contains up to date tables, charts, and references to help ensure a successful and enjoyable learning experience for you and the children you teach.

## Explanation of symbols

-  sequencing
-  measurements/math
-  weight
-  basic gardening
-  data collection, interpretation, and prediction
-  planning/imagination
-  science
-  reading
-  writing
-  motor skills
-  communication skills
-  soil
-  arts and crafts
-  propagation
-  insects
-  plant growth and development
-  experiments
-  roots
-  harvest
-  tubers
-  matching/sorting



# Table of Contents

## Plant Basics

			page
Are You a Plant?	 	     	10
The Beautiful Seed	 	          	12
Above and Below: How a Plant Start to Grow	 	           	15

## Garden Basics

Measuring and Designing Our Garden	 	      	18
Compost and Preparing the Soil		      	21
Planting the Garden		      	24
Weeding and Mulching		    	26
A Dirty Job		       	27
Pinching and deadheading		    	29
Harvesting		     	31

## Garden Themes

Sensory Garden	 	     	34
Rainbow Garden		     	36
Garden People or Deck Planters		       	38
Bean Tunnels and Tee-pees		   	41
Sunflower House or Tunnel		    	43
Butterfly Garden		     	45
A "Maze" of Maize		     	47
Flower "Beds"		   	49

## Experiments

Nutrient experiment		       	51
Tomato Experiment		        	53
The Power of Light		      	55



## Nature

Bug Hunting			57
Toad Villas			59
Caterpillars			61
Worms			63

## Arts and Crafts

First Signs of spring			66
Creating Paper Flowers			68
Making Scarecrows			70
Stepping-stones			72
Flower Pressing			74
Still Life Painting			75
A garden Storybook			76

## Games and Songs

The Magic Can			77
William the Worm			78

## Trips

Greenhouse Trip			80
Farm Tour			82

## Snacks

A Salad Party			84
Fruit Basket Investigation			86

## Useful Tables

Gardening Timetable		88
Vegetable Seed Planning Chart		92
Planting dates in Relation to Frost		93
Average seed Storage Times		93
Germination & Soil Temperature		94
Problems & Solutions		95
Mulching Materials-Pros & Cons		96
Cultivation and Care Tips		97

## Reference Section

Plants & Their Uses	98
Plants for the senses	
Dye Sources	
Cut flowers to use fresh or dry	
Curiosities	
Vines	
Various Veggies	
Herbs for smelling and touching	
Edible flowers	
Children's Garden Theme Ideas	100
ABC garden	
Animal garden	
Pizza garden	
Salsa garden	
Stone Soup garden	
Rainbow garden	
Dinosaur garden	
Key Hole garden	
Tops and Bottoms garden	
Spaghetti garden	
Peter Rabbit garden	
Fairy garden	
Recipes	106
Solar tea	
Dirt Pudding	
Veggie Dip	
Salad Dressing	
Salsa	
Refrigerator pickles	
Fruit Dip	
You Make It	108
Pizza Box Oven	
I Spy binoculars and scopes	
Bug Suckers	
Peas on Earth	
Weaving Frame	
Corn Husk Dolls	
Diagrams	116
Basic Flower diagram	
Seed and Seedling diagram	
Poisonous Plants	118
Seed and Plant Supply sources	119
References Books for Gardening with Children	122
Children's Reading Books	123
Available Resources for Teachers	125

## Are you a Plant?

Ages 3 and up (one 30-45 minute session)



### Objectives:

- To learn about plant structures and environments.
- To use plant material to encourage creativity and imagination.

### Materials:

Demonstration plants and, if available, a Venus fly-trap, pitcher plant, or mimosa ("sensitive") plant  
Magnifying lens

Art materials: sky-blue background paper, construction

Paper of different colors, cloth, dried leaves, fruits or flowers, pieces of bark, yarn, scissors, glue, and double-sided sticky tape.



### Set up:

Hang up the blue background. Set out the plants. Gather and arrange the art supplies.

### Part One:

Start by asking children whether they are plants. Talk about what makes plants different from people. Talk about whether plants are alive, how they grow, what they need to live, etc. Call the children's attention to the potted plants. Talk about the various parts and their functions. Let them pull the plants out of their pots to see the roots. Have them look closely at the roots with the magnifying lens. Talk about the Venus fly-trap or pitcher plant and talk about their biology - these plants have organs like a mouth, but the plant absorbs nutrients from the insects just like the roots absorb nutrients from the soil. Dramatic play could be incorporated here. Act out the life cycle of a plant - individually or as a group, where each child has a role such as dirt, seed, sun...

### Part Two:

Turn the children's attention to the art supplies and get creative.

Have the children make and hang up a sun and white clouds. Have them create their own flowering plants from the varied materials. Write their names on their creations and hang them up on the background. Add raindrops and insects to show other things that affect plant growth. Use this setup to talk about various **life cycles**. Link the children's ideas and creations to the class garden, or plants in and around the class. If you have already planted small plants in the garden, talk about how the plants will change over the coming weeks. Talk about **photosynthesis**.

**Questions to ask:**

What does it mean to eat? Do plants eat? Do they have a mouth? (Plants need air, water and nutrients. They combine these materials, using energy from the sun, to make their own food. All species of animals, including humans, get the energy they need to grow and live, directly or indirectly from plants). What is photosynthesis?

Do plants move? Most plants move slowly (e.g. to orient their leaves towards the light as the sun moves during the day).

Venus fly-traps can close-up quickly, and the Mimosa will fold its leaves. They're handy to have if you want to challenge the assumption that "plants don't move".

**Glossary:**

**Life cycle:** Stages of development in a life forms life. (example: seed germination to the production of seeds by a plant).

**Photosynthesis:** Process used by plants, where light energy is trapped and used to produce molecules that are used to build and sustain their life. Oxygen is the by product of photosynthesis.

**Read About It:**

*The Carrot Seed*, Ruth Krauss, Harper & Row, 1945, 2005.

*From Seed to Plant*, Gail Gibbons, Holiday House, 2000.

*The Tiny Seed*, Eric Carle, Little Simon, 1987.

# The Beautiful Seed

Ages 3 and up (three 30-45 minute session)



## Objective:

- To learn that seeds come in a wide range of sizes, shapes and colors.
- To learn about germination and the requirements needed to bring it about.
- To show the link between the seeds we plant and our kitchen tables.

For these activities, make sure children are old enough to understand that they must not put these seeds in their mouth unless instructed to do so. Be sure to find out about allergies and special eating needs of the children before offering sesame, sunflower, and pumpkin seeds or peanuts. When eating seeds/nuts, use only edible or cooking seeds obtained from a food store.



## Materials:

- Mix of dried seeds of different colors and shapes
- Whole green beans or peas.
- Whole oat seeds, **groats**, and rolled oats. (groats can be found at a health food store, a handful of each will suffice).
- Bean salad, bowls and spoons.
- Edible seeds and nuts.
- Construction paper, markers or crayons, glue, tape, glitter, paint.
- Large shallow Tupperware container.
- Pictures of plants that will grow from your seed varieties.
- Paper towels and paper plates
- Zip lock bags
- Magnifying lens
- Potting soil
- Dixie cups





### **Set up:**

Soak bean seeds in water overnight for dissection the next day.

Mix the dry assorted seeds together in the Tupperware container

Acquire or grow a bean plant, it should be at least 6 weeks old.

### **Part One:**

Start talking about seeds, encouraging the children to touch them. Have the children sort the seeds by size, color, or shape. Let the children try some bean salad, and show which of the beans in the salad come from your collection. Help the children dissect the soaked bean seeds. Use the magnifying lens to look at the various parts of the seeds. **Have the children match the parts they see with the diagram provided.** Show them the bean plant, whole beans, and bean seeds to show the different stages of that plants life cycle. Have the children handle the oat seeds. Ask them to take the seed coats off of the oat seeds. Talk about what a grain is (it's just a seed from a plant in the grass family we use for food). Show the children the groats and compare the bought groats to the **groat** they just found in their oat seed. Show them the rolled oats and see who likes oatmeal! Put some potting soil in a Dixie cup and plant some of the oat seeds and various other seeds. Water them well and place in a sunny warm place to germinate.

### **Part Two:**

Talk about what seeds need to germinate (warmth, oxygen and moisture) and what **germination** is. Set up a germination experiment using the zip lock bags. Put some dried seeds in one bag and seal it (very little oxygen and no moisture). Put a moist paper towel in the second bag with some more seeds and partially seal it (alfalfa seeds work well for this). Point out to the children that oxygen can get into this bag. In the third bag put some seeds and submerge them in water (no oxygen can get to the seeds because of the water). Put the three bags in a warm place for several days. Have the children speculate on the results. Start an experiment journal and record their responses and the results from the experiments. Pictures of the whole thing could be pasted in the journal as well. Instead of plastic bags, we used old cigar tubes donated by someone's grandfather and made a holder for them. The tubes resembled real test tubes and added to the experiment experience!

### **Part Three:**

Encourage the children to be creative with the seeds. Draw simple pictures on paper plates and glue various seeds to the plates to add color and texture to the picture. Seeds can be mixed up in bottles or jars to make a collection. Why not draw a circular map of the Earth and glue peas on it ("Peas on Earth").

### **Questions to ask:**

What is a seed coat? Is a seed alive? What does dormant mean? What do seeds need to germinate? What does germinate mean? What happened to the seeds that had been soaked in water overnight? Are they the same size as the ones in the Tupperware container? Why do plants produce seeds? Why do plants make flowers? What do we use seeds for? What are the seed leaves? What is the **Cotyledon** used for?

## **Glossary:**

**Germination:** When a seed starts to grow. The process occurs only when all environmental conditions have been met.

**Groat:** Oat seed that has had its seed coat removed.

**Cotyledon:** Used for food until the 1<sup>st</sup> true leaves emerge and the new plant can start to photosynthesis

## **Read About It**

*The Carrot Seed*, Ruth Krauss, HarperCollins, 1945, 2005.

*How a Seed Grows*, Helen Jordan, HarperTrophy, 1992.

*Seeds! Seeds! Seeds!*, Nancy Elizabeth Wallace, Marshall Cavendish, 2004.

*The Tiny Seed*, Eric Carle, Little Simon, 1887.

## **Books about Beans & Peas**

*The Big Green Bean*, Marcia Wiesbauer, Silver Press, 1995.

*Green Beans*, Elizabeth Thomas, Carolrhoda Books, Inc., 1992.

*Jack and the Beanstalk*, Richard Walker, Barefoot Books, 1999.

*Jack and the Beanstalk*, Steven Kellogg, HarperTrophy, 1997.

*Jody's Beans*, Malachy Doyle, Candlewick Press, 1999.

*Kate and the Beanstalk*, Mary Pope Osborne, Atheneum Books, 2000.

*One Bean*, Anne Rockwell, Walker & Co., 1998.

*The Pea Blossom*, Amy Lowry Poole, Holiday House, 2005.

*Pea Pod Babies*, Karen Baicker and Sam Williams, Handprint Books, 2003.

*The Very Smart Pea and the Princess-to-Be*, Mini Grey, Alfred A. Knopf, 2003.

## Above and Below; How plants start to grow!

Ages three and up (one 45 minute session)



### Objectives:

- To observe and understand, root growth and plant development.
- To learn about tubers, and roots, storage
- To learn about vegetative propagation.
- To observe the movement of water through the soil.



### Materials:

#### Root view

A Styrofoam root view unit can be purchased from the Discovery Channel Store for about \$30. This has a clear panel that allows view of the soil and root growth. Alternatively, individual root views can be easily made from soda bottles. Cut the top off of the bottle and put holes in the bottom for drainage. When the plant isn't being observed, it can be placed in a sleeve made from aluminum foil. (If darkness isn't maintained when the plant isn't being observed, not many roots will grow against the plastic).

Bean or Pea seeds.

Radishes, potato or sweet potato, carrots and onions. (An onion that has started to sprout would work great, as do old carrots that have started to get tops).

Pothos or Coleus plant to make vegetative cuttings in class.

Bulbs such as tulip or daffodil, (if available).

Potting soil (prefertilized) and plant labels,

4 jars filled with water,

knife,

Plastic bag and drinking straws

Heavy cotton string (about 12 inches).

Bushel basket



### Set up:

Purchase the root view pot or make one of your own.

Plant some bean seeds 3 weeks prior to the class.

Place a carrot or two in a plastic bag in the refrigerator with a moist paper towel so it will sprout. (This will take approximately 2 weeks), place a potato in a paper bag to sprout (could take 4 weeks).

### **Part One:**

Show the Pothos plant to the children and talk about the different parts of a plant. Talk about what plants need to grow. Carefully turn the plant over holding the top of the soil, and remove the pot so that the children can see the roots. Have them look closely at the color, and the small hairs. Talk about what healthy roots should look like. Talk about the function of the roots. Use the straws to show how water is sucked up in roots. Demonstrate **osmosis** with the cotton string. Talk about **Transpiration**. Start talking about different kinds of roots. Show them the carrots, and radishes. Talk about what storage means. Plant one of the carrots in a root view, and put another in a plastic bag with a moist paper towel. (Over the next few weeks both carrots will grow but one will live off of itself instead of soil nutrients, and shrivel). Show the children the sweet potato and potato and explain that they are an underground organ that stores energy for growing a new plant. Talk about what **starch** is. Talk about what a modified stem is and prove it by leaving a potato in the sun for a week to turn green. Talk about **chlorophyll**. Talk to the children about never eating a green potato and explain it is poisonous when it gets that way. Ask if they would like to grow a bushel of potatoes. Place a sprouted potato in a bushel basket (one from home that has sprouted will work fine), and cover it with prefertilized potting mix. Water well. In two weeks or so, the potato will have sent up shoots. When they are approximately 3 to 4 inches above the soil line, cover them again with more soil. Repeat this process over several weeks until the basket is full of soil. Continue to water and care for the plant until it flowers and then the tops die back. (This should take most of the summer). When the children dump out the basket, they should find 15 or more potatoes. **Note:** This is a good project to start inside around the middle of February. Then when the weather gets warm enough the basket can be put outside in a sunny spot to finish over the summer. It will break the boredom of winter and get the children excited about the up coming gardening activities. Just be sure to put something under the bushel basket to catch the water when it is inside and remove the catch basin when the plant is put outside.

### **Part Two:**

Turn the children's attention back to the Pothos. Explain that baby plants can start from: seeds, underground tubers, or **cuttings**. Using sharp pruning shears or scissors, take cuttings from the Pothos plant (Coleus plants also work well for this activity). Put these vegetative cuttings in a jar filled with water. Explain that the water will cause roots to form, enabling a whole new plant to grow. Talk about cloning and what that means. When the plants have established a good root system plant them into soil. You can measure the length of any shoots that are growing, and plot the length on a graph.

### **Part Three:**

As the plants grow, have the children sketch the changes in their experiment journals. The length of the roots can be monitored and measured every 2 - 3 days. If children are young, the length of a block can be used as a unit of measure. Older children can use a tape measure and graph the root length as time passes.

### **Questions to ask:**

What does cloning mean? Are you a clone? How long do you think the underground tuber or root feed the plant? Will it shrivel up as the plant gets bigger? Will new potatoes grow above the ground or under the ground? How do roots get the water and nutrients up to the leaves? What is osmosis?

**Glossary:**

**Osmosis:** The passive movement of water up or down, in or out of something (like a plant) due to a gradient change.

**Transpiration:** The loss of water through the leaves of a plant. It turns to vapor and exits the plant.

**Chlorophyll:** Green pigments in plant stems and leaves - essential for photosynthesis; Where the energy from light is trapped.

**Starch:** simple sugars used for food; Carbohydrates!

**Read About It:**

*The Enormous Carrot*, Vladimir V. Vagin, Scholastic, 1998.

*Jamie O'Rourke and the Big Potato*, Tomie dePaola, Putnam & Grosset, 1992.

*Potatoes, Potatoes*, Anita Lobel, Greenwillow Books, 2004.

*Tops and Bottoms*, Jane Stevens, Harcourt Brace & Co., 1995.

*Two Old Potatoes*, John Coy, Alfred A. Knopf, 2004. (Includes a recipe for mashed potatoes.)





## Measuring and Designing our Garden

Ages 4 and up (one 30-45 minute session)



### Objectives:

- To explore the space that will be the garden from an imaginary "bird's eye" view,
- To begin to realize the diversity of plant life in the world,
- To understand what we usually plant in our zone and why,
- To learn that there is a place for creativity in the garden.
- To understand and learn about spatial relationships
- To learn how to use a tape measure, and what units of measure are.



### Materials:

Large piece of drawing paper for each of the children  
Colored pencils or crayons and double sided tape,  
A map of the US or a globe,  
Chalk board or something large for the teacher to work on in front of the class,  
Lots of seed catalogs that can be cut up for the sake of education.  
Scissors for everyone  
Measuring tape  
Large wooden pot labels



### Set up:

Set out the seed catalogs. Take a walk into the garden with the children to measure its parameters.  
Place double sided tape in long strips on drawing paper to simulate rows in the garden.

### Part One:

Allow the children to measure several things with the tape measure (a fence, themselves, or buildings). Have them pull it out completely to see how far it will go. Ask the children if they know how long an inch is.

Show them the garden plot or the proposed space for the garden. Put a few wooden pot labels on the corners to mark the area. Show them how to measure the garden and count along with them to find out its measurements.

### Part Two:

Explain that you want them all to pretend that they're birds looking down onto the garden. Have them explain how it looks from the air. Draw the way it might look on the chalkboard. Pass out the poster board and explain what the tape signifies. Explain what paths are and have them put some in their garden picture with the crayons and colored pencils. Stress original work from each child. Have them take a seed catalog and have them search for plants they want in their garden. Have them cut the pictures out and stick them where they want them in their gardens on the sticky rows.

### Part Three:

Collect the drawings and start talking about the different plants that were chosen. Talk about the growing season and how many days your area has from the last spring frost to the first fall frost. (See table 2). Show them where they are on the globe. Talk about the equator and how warm it is there. Pull out a calendar and mark off the frost dates. Have the children count the days in between those dates explaining these will be the number of growing days in their area. Explain that they can't plant anything that has to have more days than the number they came up with. Look in the seed catalogs and see which plants fit into that category. Compare these plant choices to the art work. Encourage discussion and then have the children vote on what they will plant. Make a list of the plants they can plant and order the seeds. Make a seeding schedule (See tables 1 & 3 ).

### Questions to ask:

Why would this be a good place for a garden? How many children will fit in this space? How many plants do you think will fit in this garden? When do you think we will be able to plant our garden? What will happen if we plant seeds that need a longer time than what we have? What can we do to plant seeds that need just a little bit longer than the time we have in our area?

### Read About It:

*Eating the Alphabet*, Lois Ehlert, Harcourt Brace Javanovich, 1989.

*Growing Vegetable Soup*, Lois Ehlert, Voyager, 1990.

*Inch by Inch: The Garden Song*, David Mallett, HarperCollins, 1997.

*Princess Chamomile's Garden*, Hiawyn Oram, Dutton Children's Books, 2000.

### References:

*Schoolyard Mosaics: Designing Gardens and Habitats*, National Gardening Association, 2002.

Ideas

for school yards.

*Square Foot Gardening*, Mel Bartholomew, Rodale Inc., 2005. Ideas for gardens in a small space.





## Compost and Preparing the Soil

Ages 4 and up (2-3 30-45 minute sessions)



### Objectives:

- To understand what compost is and why its good for the garden.
- To introduce the children to machinery that cultivates the soil so they can begin to understand how it works,
- Learn basic machinery safety.



### Materials:

Compost  
Shovels, pitch forks, spades  
Magnifying lenses  
3 wooden pallets  
9 feet of 4 foot chicken wire with 2 inch holes,  
Nails and a hammer  
Rototiller  
Another adult



### Set up:

Show the children the compost and talk about what it looks like, what they think **compost** is made of. Reading books about composting will help the children understand how to create compost. Set up a simple compost bin near their garden using the wooden pallets and chicken wire. Use one pallet for the back and the other two for the sides. Fasten them together with nails or rope, and line them with the chicken wire. **(Contact your local extension office for more information on composting. The Merrimack county office in Boscawen has a backyard composting demonstration site).**

If you don't own a rototiller, contact a local equipment or machinery rental company. Rear tine tillers work best. Make sure that you're able to start, operate and stop the piece of equipment. Use gloves, closed shoes and safety glasses.

### Part One:

Encourage the children to dig into the compost. Talk about what they see in the compost (worms and many different kinds of bugs). Have them count of the number of worms they find. Many of the children understand the concept of the worm **castings** being good for the plants and garden.





Begin to move the compost pile to the garden with shovels, pitch forks and other tools. Try setting up a bucket brigade with the children. It might spice up the chore at hand. Several days may be needed to move the compost and spread it out on the garden area.

### **Part Two:**

Talk about why we prepare soil for planting. Talk about what would happen if the soil wasn't turned over in the spring. Cut a square foot of soil out of the untilled garden and show the kids how compacted it is. Talk about water getting through it. Talk about where the roots will be as the plants grow. Explain what a rototiller does.



### **Part Three:**

Have a helper bring the children to a safe distance to observe the machinery at work. Till about half the plot. Stop the equipment. Allow the children to come out and explore the newly tilled soil. Talk about how it's changed. Have the children feel the difference between the tilled soil and untilled soil.

**Part Four:** Add a worm composting bin in the classroom, kitchen or outside. As an experiment add

things that won't compost, like a plastic cup. Have the children see the difference. Ask them to make predictions.

### **Questions to ask:**

How does compost help our plants? Why do the worms like the compost so much? Why is compost good for the environment? What is humus? Why is it good to compost our yard and food wastes? What do the tines on the tiller look like? Which soil do you think the plants will like the best?

### **Glossary:**

**Compost:** Compost is made of many things like grass, leaves, stable waste and food wastes. These ingredients decompose over time and turn into **humus**.

**Humus:** the rich dark nutrient rich soil layer of your garden.

**Castings:** droppings/ manure.

### **Activities:**

Set up a worm composting lab in the classroom. Supplies available from the National Gardening Association.

Make Dirt Pudding -(see Reference Section - Recipes)

**Read About It:**

*Compost! Growing Gardens from Your Garbage*, Linda Glaser, Sagebrush, 2001.

*Dirt: Jump Into Science*, National Geographic Children's, 2002.

*A Handful of Dirt*, Raymond Bial, Walker & Co., 2000.

*Mud*, Mary Lyn Ray, Voyager, 2001

*One Small Square Backyard*, Donald M. Silver, W. H. Freeman & Co., 1993.

*Slop!*, Margaret Read MacDonald, Fulcrum Kids, 1997.

**References**

*Let it Rot! Gardener's Guide to Composting*, Stu Campbell, Storey Pub., 1998.

*Worms Eat My Garbage*, Mary Appelhof, Flower Press, 1997..

*Worms Eat Our Garbage: Classroom Activities*, Mary Appelhof, Mary Frances Fenton, Barbara Loss Harris, Flower Press, 1993.





## Planting the Garden

Ages 3 and up (many 30-45 minute sessions until the entire garden is planted).



### Objectives:

- To learn how to plant (depth and size of holes for plants or seeds)
- To understand how to space plants for healthy growth
- To becoming aware of proper use of tools in the garden
- To become aware of the garden paths.



### Materials:

Plants and seeds

Gardening tools (trowels for everyone and a hoe)

Pot labels

Washable and permanent markers

Another adult.

### Set up:

Create the garden paths. (We used landscape fabric for paths).

Ready the rows to be planted before the children come out to help.

When planting with young children, try to get the help of another adult. One adult can supervise the taking of plants and seeds. The other adult can help the children do the planting.

For each plant, create two labels with a matching symbol that children can easily recognize. Place one label in the container of the plant to be planted and the matching label in its garden location. Talk to the children about the symbols and matching before they join you in the garden. Allow the children to match the pot symbol to the location symbol in the garden. Take them on a garden path walk, and ask them to be aware of their bodies in the garden.



### Part One:

The children should choose their plants and find the location where they should be planted. Explain how large they should make the hole. Talk about different spacing for different plants. Do they know why the tomatoes are spaced so far apart? If plants are spaced too closely they won't have what they need to grow, will become weak and may get diseased. If plants are spaced too far apart, more weeds will grow. (See table 1 for proper plant spacing).

### Part Two:

After the plants are transplanted into the garden, start sowing seeds. Explain how deep different seeds should be planted, following the packet directions. Sow a few extra seeds that will be thinned out later. Make labels with permanent markers to show where seeds have been sown.

**Part Three:**

Thoroughly water all the transplants and seeds. Clean up all the tools and put them away. Wash hands and reminisce.



**Questions to ask:**

Why did you choose this plant? What type of plant are you planting? How big does the hole need to be for that plant? Do you remember why we can't plant seeds too deep? What do seeds need to germinate? Why do we pat the seeds down once we plant them? Why do we water everything after we plant it? How long will it take for the seeds to come up through the ground? Why don't the roots grow up and leaves grow down? What will happen if we put a plant in the ground upside down? (Try it!) Why are worms good for the soil? What is the name of the tool you are using? Why should we clean up our tools after we are through planting?



**Read About It:**

*Eddie's Garden & How to Make Things Grow*, Sarah Garland, Frances Lincoln, 2004.  
*How the Groundhog's Garden Grew*, Lynne Cherry, Blue Sky Press, 2003.







## Weeding and Mulching

Ages 3 and up (3-4 sessions of 30-45 minutes)



### Objectives:

- To learn about the benefits of mulching the garden
- To distinguishing weeds from desired plants,
- To become aware of plant characteristics,
- To understanding what makes a weed, a weed.



Mulch reduces the amount of weeding and hoeing that will have to be done in the garden. When mulch

decomposes, it can add organic matter to the soil. It can warm the soil for an earlier start, or keep it cool in hot weather. Mulch helps conserve moisture and prevents the possibility of erosion. There are several different choices for mulch, choose whatever works best for your garden. This may require research on your part for what is available in your area. We chose salt marsh hay, because it was available in our area and doesn't contain weed seeds.

*See table 6 for the pros and cons of different mulches.*

### Materials:

Hay bales, or other mulch,  
Wheel barrow or 5 gallon buckets for carrying the mulches.

### Part One:

After the bales of salt-marsh hay were delivered, we allowed the children to jump off them and play. The children adjusted to the smell of the hay (it smells salty or musty). Talk about the benefits of mulching and what weeds are. Go on a weed hunting expedition.

### Part Two:

Demonstrate how to spread the mulch around the plants then supervise the fun.

### Questions to ask:

- Do you know what weeds are?
- How can we eliminate the weeds in the garden besides mulching? Could we step on them all? Pull them up?
- Why does covering weeds with mulch stop them from growing?
- What is another reason that it's good to mulch a garden?



### Activity:

Make paint brushes with hay as a material. Be aware that some children may have allergies.



## A Dirty Job

Ages 4 and up (two 60 minute sessions)



### Objectives:

- To show the water holding capacities of different garden soils and learn the affects those capacities can have on plant growth.
- To gain some understanding of soils and how it maintains plant life.  
*Can be used with section 5.2 to learn about toads.*

### Materials:

Source of Heavy Clay soil (clay can be bought in a craft store and used if clay soil isn't available).  
Three, gallon size, zip lock bags filled with different soils: One with sandy loam, one with sand, and one with clay  
Dry grass clippings  
5 gallon bucket  
3 Clear plastic cups or soda bottles  
Sticks and stuff for decorating  
Water  
Paper towels  
Several plastic dish pans; one for every two children.



### Set up:

Dig up clay from the ground and place it in a 5 gallon bucket. Add water to smooth it out and mix it up. Remove any debris and life forms like rocks, sticks and worms.  
Find two other kinds of soil, preferably sandy loam and sand. Put some of each in the zip lock bags. Put holes in the bottom of the plastic containers.

### Part One:

Encourage the children to explore the differences in the soils. Talk about water holding capacities of different soils. Put the three different kinds of soil in the clear paper cups and put them side by side on paper towels. Talk to the children about how fast or slow water goes through soil. Talk about how water mixes or dissolves nutrients in soil. Explain how that nutrient rich water is taken up by plants. Use the stop watch to time a few cups of water draining through the different soils in the plastic cups. If you couldn't get a stop watch, or for more excitement, have the children count and record what number they got to before the water came out the bottom each cup. Talk about which kind of soil might be best or bad for plants and why.

## Part Two:

Introduce the idea of using the clay soil to create adobe and introduce what adobe means and what it is used for. Make toad houses or other garden art out of the adobe by passing out dish pans to groups of two, dividing the clay up among the children and encourage them to get their hands dirty. Amend the clay with the grass clippings to provide added strength. A ratio of 2:1 clay to clippings works well. Divide the amended clay up evenly among the children. Have fun creating and constructing. Place the creations in the sunshine to dry. When they are completely dry, have your little gardeners choose a special place for their masterpieces to reside for the summer.

## Questions to ask:

What is dirt made of? How do plants get the nutrients from soil? Why does water move so fast through sand? What does transpiration mean? Where do the nutrients in the soil come from?

## Activity:

At snack time drink with straws, a good way to demonstrate how water is taken up and roots function.

## Read About It:

*Frogs and Toads*, Bobbie Kalman and Tammy Everts, Crabtree Pub., Co., 1994.

*Frog and Toad Together*, Arnold Lobel, HarperTrophy, 1979.

*From Tadpole to Frog*, Wendy Pfeffer and Holly Keller, Harper Collins, 1994.







## Pinching and Deadheading

Ages 3 and up (one 30-45 minute session)

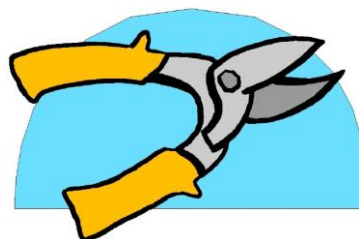


### Objectives:

- To understand what "going to seed" means,
- To show a plants response to pinching and deadheading,
- To learn proper maintenance of the garden,
- To encourage observation.

### Materials:

Scissors,  
A bucket for carrying flowers,  
A bucket for the spent flower heads,  
Jars or vases filled with water



### Part One:

Take a walk into the garden and show the children the **nodes** on a flowering plant. Explain that they are going to cut their plants just above a node. Talk about what might happen when they do this and what the benefits may be. Next find plants in the garden with **spent flowers**. Explain their next task will be **deadheading**. Both of these techniques encourage more branching and growth. Explain that if they don't deadhead the plants will go to seed and stop flowering. Show the children how to carry out the activity and then allow

them to cut and deadhead.

### Part Two:

Bring the cut flowers indoors and add them to the vases with water for everyone to enjoy.

### Questions to ask:

Why do plants flower? What will happen if the spent flowers are left on the plant? What will happen when we cut the flowers? If we let the spent flowers go to seed, can we plant those seeds to grow more flowers? If the plants branch more will they produce more flowers? How can we keep the cut flowers fresh indoors? How long do they think the flowers will last indoors? Why?

### Glossary:

**Node:** the point where leaves grow on the stem of a plant.

**Internode:** The space on the stem between each node.

**Deadheading:** act of removing a flower which has begun to wilt or die.

**Activities:**

Make a weaving frame in the garden. (See Reference Section -You Make It, for diagram). Warp up the frame with baler twine or string. Have children use any long weeds and prunings to weave.

Over and under,  
In and out,  
That's what weaving,  
Is all about.

Tuck the spent flowers into the weaving. This can be added to each day. When the frame is full, the weaving can be cut from the frame, dried and brought inside for decoration.

Use flowers for a still life painting in the classroom.

Use tweezers and magnifying glasses to dissect old flowers that have gone to seed; this works well with older sunflowers.

How do flowers take up water with no roots? Put a white carnation in a glass of water with food coloring and watch the color change.



## Harvesting

Ages 2 and up (many 30-45 minute sessions)



### Objectives:

- To understand the difference between ripe and unripe produce
- To learn the joy of sharing



### Materials:

Scissors  
Baskets  
Paint chips  
Large wooden plant labels,  
Hole punch



### Set up:

Go to a hardware store and get paint chips in a variety of "ripe" colors. Punch holes in the paint chips and attach them to the wooden plant labels. Place them in the garden with the plant that is ripe when it is that corresponding color. For example: Tomatoes are ripe when they are red.



### Part One:

Start by explaining the colored labels. Instruct the children to pick only those fruits that match the colors on the paint chips. Show them that each kind of plant has a different color. Show them what you mean by picking one ripe fruit from each vegetable choice. Don't get upset if they pick unripe produce.



As all of you work in the garden re-enforce the difference between ripe and unripe fruit by pointing out examples. Enjoy all your hard work by making a salad and cooking some of the vegetables. Send the produce home with the children so they can share their experiences with their parents. If possible, share some of the harvest with less fortunate folks.

### Questions to ask:

What would happen if the seeds in the ripe fruit were dried and planted?  
What would happen if we picked our tomatoes before they're ripe?  
Why does fruit ripen? Read a book about fried green tomatoes.

**Activities:**

Read the story *Stone Soup* and make Stone Soup with each child contributing something from the garden.

You may want to take the children to a local Farmer's Market to see all the ripe vegetables and fruits for sale.

If you have planted pumpkins, carve or decorate them for the Harvest Festival.

Have a fall Harvest Celebration and invite families to see the results of all your efforts.

**Read About It:**

## Stone Soup

*Bone Button Borscht*, Aubrey Davis, Kids Can Press, 1995. (Eastern European version)

*Button Soup*, Doris Orgel, Banta, 1994

*Pea Soup Fog*, Connie Macdonald Smit, Down East Books, 2004 (Includes a recipe for pea soup)

*Stone Soup*, Ann McGovern, Scholastic, 1968.

*Stone Soup*, Heather Forest, August House LittleFolk, 1998. (Includes a recipe.)

*Stone Soup*, Jon J. Muth, Scholastic Press, 2003. (An Asian tale)

*Stone Soup*, Marcia Brown, Aladdin, 1997.

*Tumbleweed Stew*, Susan Stevens Crummel, Green Light Readers, 2000. (Includes a snack recipe)

## Pumpkins

*From Seed to Pumpkin*, Wendy Pfeffer, HarperCollins Pub., 2004. (Includes a recipe for roasted pumpkin seeds.)

*Pumpkin Blanket*, Deborah T. Zagwyn, Tricycle Press, 1997.

*Pumpkin Book*, Gail Gibbons, Holiday House, 2000.

*Pumpkin Circle*, George Levenson, Tricycle Press, 1999.

*Pumpkins*, Jacqueline Farmer, Charlesbridge, 2004.

*Pumpkins: A Story for a Field*, Mary Lyn Ray, Voyager, 1996

*Pumpkin Fiesta*, Caryn Yacowitz, HarperCollins Pub., 1998 (Includes a recipe)

*Pumpkin, Pumpkin*, Jeanne Titherington, Greenwillow Books, 1986.

*Pumpkin Soup*, Helen Cooper, Farrar Strauss Giroux, 1998. (Includes a recipe)

*Too Many Pumpkins*, Linda White, Holiday House, 1997.

## Markets

*Farmers' Market*, Paul Brett Johnson, Orchard Books, 1997.

*Market!*, Ted Lewin, HarperTrophy, 1996

*Market Day*, Eve Bunting, Joanna Colter Books, 1996.

*Market Day*, Lois Ehlert, Harcourt, Inc., 2000.

*Market Days: From Market to Market Around the World*, Marti Shohet, BridgeWater Books, 1995.

*To Market, To Market*, Anne Miranda, Harcourt, Inc. 1997.

**Resources:**

*Kids' Pumpkin Projects*, Deanna F. Cook, Williamson Pub. Co., 1998.

*The Perfect Pumpkin*, Gail Damerow, Storey Communications, 1997.

Making flour from groats.



Where there's a will there's a way!



Pride in a job well done!







## Sensory Garden

Ages 2 and up (one 30-45 minute session)



### Objectives:

- To expose children to gardening through their 5 senses
- To use plants as a means to relate to the outside world.

### Materials:

Large containers, pre fertilized potting soil, or a spot in the garden, preferably one that gets a lot of traffic.

A large assortment of Plants that appeal to all our senses: Sensitive plants (touch), Heliotrope(smell), Statice & Straw flowers(touch and sound), Dusty miller(touch), Scented geraniums(smell), Peas(taste), Annual poppies(see and hear), Lamb's ear(touch), Nasturtiums(see and taste), Pansies, Johnny jump-ups(see), assorted herbs(smell and taste).

Pot labels

Indelible marker and crayons

3x5 cards (unlined).

### Set up:

Draw an eye or an ear or a nose or a hand or a mouth on the labels. Put the labels in the plants so the children will know which sense that plant represents. Ready the area to be planted by enriching the soil if needed, or fill the containers.








### Part One:

Discuss the five senses with the children (Touch, Smell, Taste, Hearing, and Vision). Try to connect the plant selections to the senses.

Encourage the children to see, smell, taste, hear, and touch the plants.

Help the children put the potting soil into the container. Encourage the children to have fun while they plant their

containers or site; supervise the fun. Water the plants well. Put the containers in a sunny location. Have the children draw pictures of what certain plants smell like on 3x5 cards. For example, Orange geraniums smell like Oranges and Nutmeg geraniums smell like cookies! Laminate the cards and attach them to sticks. Label the plants in the garden with the pictures.

 see	 hear
 smell	 touch
 taste	

### Questions to ask:

What good could a strong smell be to a plant? Why do some plants have lots of hairs on their leaves? Are there any plants in the Sensory garden that you have at home? Why do some plants have pickers? Why does the sensitive plant close when we touch it?



**Some good plants to use for this garden are:**

Eyeball plant (*Spilanthes oleracea* If tasted it will numb your gums and lips), Basil, Chives, Bread-Seed Poppy (*Papaver sp.* ; They rattle when they dry!), Scented Geraniums (come in a multitude of smells like roses, lemon, nutmeg...), Thistles (are prickly; some just enough to prove the point!), Mints (come in a multitude of scents like pineapple, chocolate, orange...), Nasturtiums (are very brightly colored and have a peppery taste), Rabbits foot grass (is soft on your face and to touch), Lambs ears (are fuzzy!).

**Activity:**

Make a Closed Bag game. Put leaves in a bag, ask children to smell. What does it smell like? Document the different types of leaves using clipboards, paper and pens.



## A Rainbow of Colorful Flowers and Vegetables

Ages 3 and up (two to three 45 minute sessions)



### Objectives:

- To introduce the concept of planning a garden using the colors in a rainbow.
- To associate colors of plants (flowers and vegetables) with the colors in the rainbow.



### Materials:

Chalkboard or Some large marking surface to draw designs on.  
Plants and seeds.  
Non toxic water based exterior paints  
Large rocks  
Smocks and paint brushes.  
Stepping stones



### Set up:

Gather stones for painting. Make stepping stones.  
Buy a large assortment of colorful flowering plants.

### Part One:

Have the children discuss what they would like their rainbow garden to look like (Section 2.2). Make drawings of different rainbow designs on the chalkboard to show the choices available. A vote may be necessary to come to an agreement between many children. Talk about the different flowers and plants available to create their rainbow garden. Talk about how they can use lots of one flower to create parts of the rainbow; like all white flowers for clouds. Don't limit the plan to plants. Talk about adding artwork to their rainbow. Artwork can fill in spaces that may occur throughout the season. Stepping stones and painted rocks work well. Transfer the design to a large piece of poster board to use as a reference when you go outside.

### Part Two:

Get to it!

Use the appropriate activities in section 2 and let the children plant the garden, using the poster board reference as their guide.

### Part Three:

Set the children up with the paints, smocks, rocks and paint brushes. After they are painted and dry, place them throughout the planted garden.



## Questions to ask:

What are the colors in a rainbow? What flowers or vegetables can we use to have all the colors of the rainbow in our garden? Do we want to have clouds at the end of each side of the rainbow? Why are flowers different colors? Flowers have different pigments that give them different colors. What is a pigment? Why is being colorful beneficial to flowers?

## Read About it:

*Blue Potatoes, Orange Tomatoes*, Rosalind Creasy, Sierra Club Book, 1994.

*Growing Colors*, Bruce McMillan, HarperTrophy, 1998.

*The Little Green Island with a Little Red House: A Book of Colors and Critters*, Sharon Lovejoy, Down East Books, 2005.

*Planting a Rainbow*, Lois Ehlert, Harcourt Brace Jovanovich Pub., 1988.

*The Rainbow and You*, E. C. Krupp, HarperCollins, 2000.

*Still-Life Stew*, Helen Clare Pittman, Hyperion Books, 1998. (contains a recipe for stew)

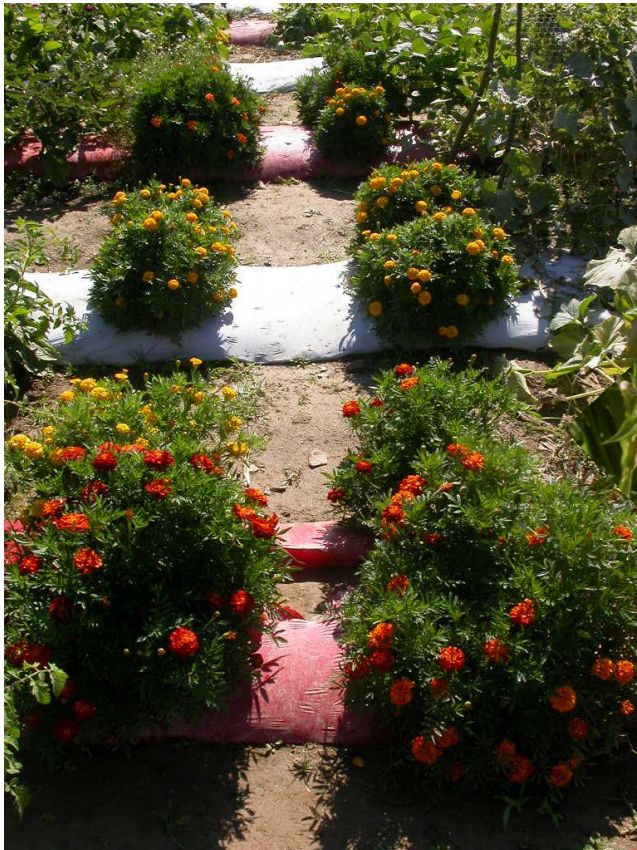
## References:

*Arty Facts: Plants & Art Activities*, Crabtree Pub., 2002.

*Berry Smudges and Leaf Prints: Finding and Making Colors From Nature*, Ellen B. Senisi, Dutton Children's Books, 2001

*The Edible Rainbow Garden*, Rosalind Creasy, Periplus, 2000.

Dole 5 A Day web site: [www.dole5aday.com](http://www.dole5aday.com) has charts for the fruits and vegetables in all colors.





## Garden People or Deck Planters

Ages two and up (one 30–45 minute session)



### Objectives:

- To create small sensory gardens toddlers can become involved with.
- To instill a sense of responsibility in older children,
- To learn the importance of water to plants.

### Materials:

#### (For garden person)

- 10" plastic terra cotta pot
- One piece of 2x6x2 pressure treated board, 36" long
- 2 - 12" pieces of rebar
- Cordless drill
- Vinyl tablecloth
- 1 package,  $\frac{1}{4}$  " elastic waste band.
- Sewing machine
- 2 - 2 inch plastic pots
- One 2" lag bolt and washer
- Pre fertilized potting soil
- Assorted plants to create the hair; colorful, smelly, and viney.



### Materials:

#### (For plain deck planters)

- Large deck planters or pots
- Pre fertilized potting soil
- Assorted plants



### Set up: (for garden people).

Drill two holes in the bottom of the 2x6 to accommodate the rebar. It will be inserted at least 3 inches so it can be pushed into the ground to stand the people up. Cut the table cloth into three pieces: (1) 30"x42", (2) 12"x12".

Zigzag stitch the waste band to one side of each of the 12x12" pieces, and to both 30" ends of the 30 x 42. Fold the 12x12 pieces in half (right sides together) creating a tube, straight stitch making sure to leave the elastic end open to accommodate the 4"pot hands. . Turn right side out (these are the arms). Cut the 30x42 inch piece in half lengthwise. Pin the arms to the top of one of the halves. Place the other half over the pinned half, right sides together; straight stitch both



raw edges through all the thicknesses to create the dress (you should have elastic at the top and bottom of the dress).

Pre drill a hole in the center of the 2x6, on the top, to attach the pot to the board.

### **Part One: (garden people)**

Have the children draw a face on the terra cotta pot. Talk about the people you are creating. Talk about the responsibility of watering them. Talk about the importance of water to everything. Introduce the term transpiration. Continue to construct the people while talking about the importance of water. Push the rebar into the board and into the ground. Pull the dress over the board all the way to the ground. Insert the 4" pots into the ends of the arms. Attach the terra cotta pot to the top of the board using the lag bolt, washer and drill. Have the children fill the pot with potting soil. Point out the fertilizer in the soil. Discuss the difference between garden soil and potting soil. Have the children plant the hair. Water the plants in well. Assign watering responsibilities to each of the children for the summer.

*(One ten inch pot should be watered **thoroughly** at least every 4 days when the weather is very dry and hot).*

### **Part One: (plain deck planters).**

Fill pots with soil, plant plants and assign watering responsibilities. Have the same discussions about water and soil as for the garden people project.

### **Questions to ask:**

How much of our body is made of water? How much of a plants body is made of water? How do plant roots take up water? Where does the water go when the plant takes it up? Does it stay in the plant? Where does it come out? What does **transpiration** mean? Do we transpire? Ask what the difference is between perspiring and transpiring.

Some good plants to use for this garden are:

Eyeball plant (*Spilanthes oleracea* If tasted it will numb your gums and lips), Basil, Chives, Bread-Seed Poppy (*Papaver sp.*; They rattle when they dry!), Scented Geraniums (come in a multitude of smells like roses, lemon, nutmeg...), Thistles (are prickly; some just enough to prove the point!), Mints (come in a multitude of scents like pineapple, chocolate, orange...), Nasturtiums (are very brightly colored and have a peppery taste), Rabbits foot grass (is soft on your face and to touch), Lambs ears (are fuzzy!).



### **Glossary:**

**Transpiration:** the loss of water through the leaves of a plant.

### **References:**

*Can't Miss Container Gardening*, Felder Rushing & Teri Dunn, Cool Springs Press, 2005.

*Kids' Container Gardening*, Cindy Krezel, Ball Pub., 2005.

*McGee & Stuckey's Bountiful Container*, Rose Marie Nichols & Maggie Stuckey, Workman, 2002.



## Bean Tunnels and Teepees

Ages 5 and up (two 30-45 minute sessions)



### Objectives:

- To create a sense of ownership in the garden by the children
- To entice children to play in the garden
- To be creative with natural materials in the garden.

### Materials:

Baling twine

Fresh cut saplings or branches from the woods, approximately 1 inch round and 10 feet long.

Scissors

Shovel

Vine seeds



The tunnels or teepees are a fun and interactive type of trellis for the garden.

Bean plants come in two forms, bush and pole. When planning the tunnels or teepees, choose pole bean varieties. Their vines will grow 10 feet or more throughout the growing season. The addition of morning glories will add bright color. **Note: Never use sweet peas. Their seeds are poisonous if ingested.**

### Part One:

Have the children collaborate and vote on the shape of the structures, e.g. teepees, tents, zigzagging tunnels? Decide where in the garden the structure(s) will be placed. Do they want to go through a maze of corn to get to it?

### Part Two:

Once a location is decided upon, help the children place the poles in the desired pattern. Using the twine, tie the poles together at the top. Dig holes and bury the ends of the poles. Using more twine, create webbing for the plants to climb up. This is a good time to talk about weaving!

### Part Three:

Plant the beans and morning glories around the base of the structure 2 inches apart.

Don't plant seeds or plants in the entryway/doorway.

If using seeds, you can have the children measure them once they've sprouted and keep track of how many days it takes to harvest.



If poles aren't available, try planting Mammoth Sunflowers to create the structure. See section 3-  
"Sunflower House".









## Sunflower House and/or Tunnel

Ages 3 and up (one 45 minute session)



### Objective:

- To create a special place to play.
- To create a sense of ownership and belonging in the garden.
- To entice children into the garden.



### Materials:

Sunflower transplants; Tall, medium and short varieties.

### Set up:

Read The Sunflower House by Eve Bunting with the children. Talk to them about creating a sunflower house in their garden like the one in the story. Suggest a sunflower tunnel. (Sunflowers can be planted to form circles, squares, a star, a heart, etc. Remember, the flowers will always orient themselves toward the afternoon sun).



### Part One:

Have the children choose a pattern. You can use the same variety or height of sunflower, or combine plants of different sizes for a more lush appearance.

### Part Two:

Use wooden labels or sticks to mark out the chosen design in the garden plot and to indicate where each plant should go. Set the labels approximately 1 to 1  $\frac{1}{2}$  feet apart for medium density of plants. This will give ample room for the sunflowers to grow. You may want to leave extra space for the "door" to go in the house. Follow the [Planting the garden](#) activity. If direct seeding into the garden is planned, sow several seeds in each spot and thin out after germination. See table (3) for the proper seed planting times in your area).



### Part Three:

If you planted the Mammoth sunflower variety, you can tie the flower heads together once the plants have grown tall enough to form a roof. If you planted the medium to dwarf varieties, you can

make a roof of Morning Glories or pole beans which should be planted 2 inches from the sunflower plants once the sunflowers are approximately 12 inches tall. Make the vine support with twine by tying it from the base of the flower head of one sunflower to another, creating a web. For more detailed instructions on how to make the roof refer to the book *Roots, Shoots, Buckets, and Boots* by Sharon Lovejoy.

#### **Part Four:**

Once the sunflowers bloom, share a special picnic inside the house!

#### **Questions to ask:**

Why do we call them sunflowers? Even though they look like the sun, we call these plants sunflowers because their blossoms will track the sun's movement.

How tall are our sunflowers? Are we taller or shorter than the sunflowers? Is the flower head one flower or many flowers? Use a hand lens to show that a sunflower inflorescence is a composite of many individual flowers sitting together on a head. Do we have other flowers in this same family in our garden? Marigolds for instance? Talk about plant families.

#### **Read About It:**

*Backyard Sunflower*, Elizabeth King, Dutton Children's Books, 1993.

*Katie and the Sunflowers*, James Mayhew, Orchard Books, 2000.

*A Handful of Sunshine*, Melanie Eclare, Ragged Bears, 2000.

*Sunflower House*, Eve Bunting, Harcourt Brace & Co, 1996.

*Sunflower Sal*, Janet S. Anderson, Albert Witman & Co., 1997.

*Wild Wild Sunflower Child Anna*, Nancy White Carlstrom, Macmillan Pub., 1987.

#### **References:**

*Roots, Shoots, Buckets & Boots*, Sharon Lovejoy, Workman Pub., 1999.

*Sunflower Houses: Inspiration from the Garden*, Workman Pub., 2001.







## Butterfly Garden

Ages 4 and up (several 30-45 minute sessions)



### Objectives:

- To learn about butterflies and attract them to our garden.

### Materials:

Books about butterflies and gardening for butterflies

Selected plants (e.g. Bee Balm, Globe Thistle, Perennial Sunflower, Veronica, Shasta Daisy, Purple Cone Flower, Black-eyed Susan, Verbena, French Marigolds, Liatris, Petunias, Yarrow, and Butterfly Weed)

Shovels and plant labels

### Set up:

Choose a site for the butterfly garden that is sunny and sheltered from wind. Watch butterflies in any nearby open space, noting the flowers they visit. Typically, butterflies are attracted to plants with purple and pink flowers and hummingbirds like red flowers. (A good reference book on butterfly gardens will give you a list of butterflies found in your region and plants they are attracted to). Design the garden or guide children to create a design using selected plants. Prepare the garden site and acquire or grow the plants selected.

### Part One:

Introduce the children to the topic of butterflies by reading books and researching butterflies found in your area. If possible, raise a butterfly with the children. They will enjoy watching the process of metamorphosis from caterpillar, pupa to adult butterfly. Monarchs work well for this and are easy to find on milkweed plants. Have the children draw pictures, and speculate on how many days it will take the butterfly to emerge. Talk about planting a garden that will attract butterflies.



### Part Two:

To plant the garden, follow directions from planting the garden activity. After the planting is complete, sink a shallow dish in the soil to create a water source. Place it in a sunny spot. It will help attract butterflies that enjoy drinking from mud puddles. A couple of plastic wine glasses with pieces of fruit in them placed strategically among the plants will attract the butterflies that feed on fruit and lay their eggs in flowers. Apply a layer of mulch to reduce the need for frequent irrigation and weeding.

### Questions to ask:

How can we attract butterflies to the garden? Why are butterflies attracted to mud puddles? Did you know that by drinking from mud puddles, butterflies obtain needed salts? What is a butterfly



baby called? What does it do to plant leaves? Do butterflies have the same kind of mouthparts as their babies?

**Activity:**

In the art area explore the symmetry with children, folded paintings is a simple way to do this.

**Read About It:**

- Butterfly House*, Eve Bunting, Scholastic Press,1999.
- Butterflies in the Garden*, Carol Lerner, HarperCollins, 2002.
- Fairy Flight*, Tracy Kane, Light-Beams Pub. 2003.
- Monarch Butterfly*, Gail Gibbons, Holiday House, 1991.
- Very Hungry Caterpillar*, Eric Carle,
- Waiting for Wings*, Lois Ehlert, Harcourt, 2001.
- Where Butterflies Grow*, Joanne Ryder, E. P. Dutton,1989.

**References:**

- Butterfly Gardens*, Brooklyn Botanic Garden, Inc. 1995.
  - The Family Butterfly Book*, Rick Mikula, Storey Books, 2000.
  - Monarch Magic!*, Lynn Rosenblatt, Williamson Pub. Co.,1998.
- Equipment for rearing inside, feeders, etc. is available from the National Gardening Association.





## A Maze of Maize

Ages 2 and up (two 60 minute sessions to create)



### Objectives:

- To add variety to the garden plan,
- To teach proper seed spacing,
- To learn to use measuring devices,
- To understand why certain seeds are planted at depths,
- To encourage exploration, imagination, and enjoyment



different

### Materials:

Corn Seed - (These are usually covered with the Captan unless they are organic seeds, the teacher should handle the seeds wearing plastic gloves).  
 Hole Measuring tool - see photo  
 Turf grass Drum roller  
 10' x 1" sticks to make a teepee.  
 Two other adults  
 Hoe or metal rake

fungicide

### Set up:

Create a measuring tool with two sticks. Attach string, two inches up each stick and 12" apart. See photo. Use the roller to create the pathways for the maze on newly rototilled ground. The pathways will help the children know where to walk and where to make the holes for the seeds. Place the teepee in the center of the maze. Talk with the children about mazes before bringing them out to plant. Have them draw a few mazes on paper. Give them some mazes you drew ahead of time and help them go through the maze with a crayon. Introduce the idea of planting a maze in their garden.



### Part One:

Once in the garden, the children will use the hole- measuring tool to ensure that the plants will be 12 inches apart and 2 inches deep. One adult should help them create the holes along both sides of the path in the fluffy rows. The second adult can follow and add 3 corn seeds to each hole. The third adult can walk behind the second adult and cover and tamp the seeds in, with a hoe or metal rake. Side dress the corn rows with blood meal and work it into the soil. Have them plant morning glory seeds or pole bean seeds around the base of the teepee. Put a layer of straw or hay in the floor of the teepee to sit on and keep weeds from growing. Water the seeds in well.

### Part Two:

As the corn grows, the children will begin to see the development of the maze. Have them make a sign for the entrance of their maze.

**Questions to ask:**

Everything relating to corn and it's development. Everything about seeds and their germination. See section 1.



When the corn ears are just starting to "silk," pick the two flowers from one of the corn stalks. (The top, the "tassel," is the male flower that carries the pollen, and the ear of corn is the female flower that contains the pistils which we call silk.) Have the children carefully dissect the female flower, one husk at a time, and look at how each of the pistils goes to one kernel of corn. Corn is pollinated by wind. That's why we plant it close together in blocks or in threes.

**Activities:**

Look closely at some popcorn seeds purchased at the grocery store. Place some popcorn kernels in a plastic bag with a moistened towel and watch for germination. Pop some corn for a snack.

Make corn husk dolls. See Reference Section - You Make It for directions.

**Read About It:**

*Carlos and the Cornfield*, Jan Romero Stevens, Rising Moon Books, 1999. (Bilingual)

*Corn is Maize*, Alike, Harper Trophy, 1986

*The Huckabuck Family*, Carl Sandburg, Farrar Straus Giroux, 1999.

*Popcorn!* Elaine Landau, Charlesbridge Pub., 2003 (Includes recipes)

*Popcorn*, Tomie dePaola, Holiday House, 1984.





## Flower "Beds"

**Ages 2 and up (many 30 minute sessions)**



### Objectives:

- To turn ordinary into extraordinary!
- To use art in the garden,
- To create a sense of wonder and belonging.

### Materials:

- Pieces of pressure treated plywood - one for each bed
- A 8x10 raised flower bed.
- Loads of flower transplants
- Trowels
- Exterior primer
- White latex exterior paint- satin finish.
- Exterior acrylic paint - all the primary colors- 1 half pint each.
- Assorted paintbrushes for artwork and priming and painting large pieces.
- Clear exterior sealer
- 4 - 4" Lag bolts with washers
- Jig saw
- Cordless drill



### Part One:

Buy (one) 4x8,  $\frac{3}{4}$  inch, exterior grade plywood. With a pencil, divide the plywood up lengthwise into two pieces. One will be 1'x8" (the footboard) and the other will be 3'x8" (the headboard). Prime each piece of plywood, on both sides. Free hand a whimsical headboard and foot board on the two pieces. Cut them out using the jigsaw. Once the pieces have been cut, prime the edges with the white primer. Top coat both pieces and their edges with the exterior white paint. Attach the headboard and footboard to the flower bed with the lag bolts and washers using the power drill.

### Part Two:

Allow the children to paint colorful pictures of flowers and outdoor scenes on the boards. Let their creativity run wild! After they have completed painting, seal their paintings with a clear acrylic sealer. This will help protect their artwork from rain and bad weather.





### Part Three:

Add compost to the beds, place stepping stones across the middle for ease of weeding, and plant the beds with the flowers. Follow the directions for planting the garden, section 2.6.

### Questions to ask:

Anything related to planting and colors.

### Read About It:

*Bud*, Kevin O'Malley, Walker & Co., 2000.

*Flower Garden*, Eve Bunting, Harcourt, Brace & Co., 1994.

*Jack's Garden*, Henry Cole, Greenwillow Books, 1995.

*The Reason for a Flower*, Ruth Heller, Grosset & Dunlap, 1983.

*Miss Rumphius*, Barbara Cooney, Viking Press, 1982. (Lupins)

*The Moonflower*, Peter and Jean Loewer, Peachtree Pub., 1997.

*This is Your Garden*, Maggie Smith, Crown Pub., 1998.

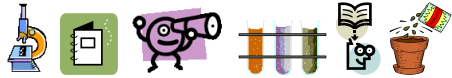
*Zinnia's Flower Garden*, Monica Wellington, Dutton Children's Books, 2005.





## Nutrient Experiment

Ages 4-5 (one 30-40 minute session)



### Objectives:

- To help children understand what nutrients are
- and their importance to plant growth.

### Materials:

4 week old seedlings  
3- 4" plastic pots  
3 plastic pot labels  
All purpose, nutrient free, potting mix  
Water  
Miracle grow  
Clear glass jug  
Plastic funnel



### Set up:

Plant an overabundance of seeds in all purpose nutrient free potting mix. Grow for 5 weeks with nothing but water. This will encourage plants to take on a light green starved appearance.

### Part One:

Start out by talking to children about what plants need to grow. If possible, look out a window at healthy grass. Call the color of the grass to their attention and have them compare the color to the plants you brought in for the experiment. Talk about what the plants outside have compared to the plants indoors. Suggest the reason for the light color may be nutrient related and talk about what nutrients are. Talk about what would happen if they were only allowed to have water and no food, the perfect amount of food, and too much food. Discuss the same situation with plants and have them speculate on what might happen if the plants were subjected to those conditions. Propose an experiment. Write down their answers in their experiment journal.

### Part Two:

Have the children fill one pot apiece. Have them transplant one of the starving plants into their pots after you demonstrate proper transplanting techniques. Put a tag in each pot with the child's name that planted it and label it #1, #2, or #3. Explain that each child is going to feed their plant differently. One will give their plant just water and talk about how water doesn't have hardly any nutrients in it. One child will give their plant the perfect amount of fertilizer water (show them the directions on the box and mix it into a glass jug so they can see the color change). Finally, the last child will give their plant too much fertilizer (add 6 or 7 times as much fertilizer to the water as on the directions). Call the color change to their attention and talk about what might happen to the plant that gets way too much food.

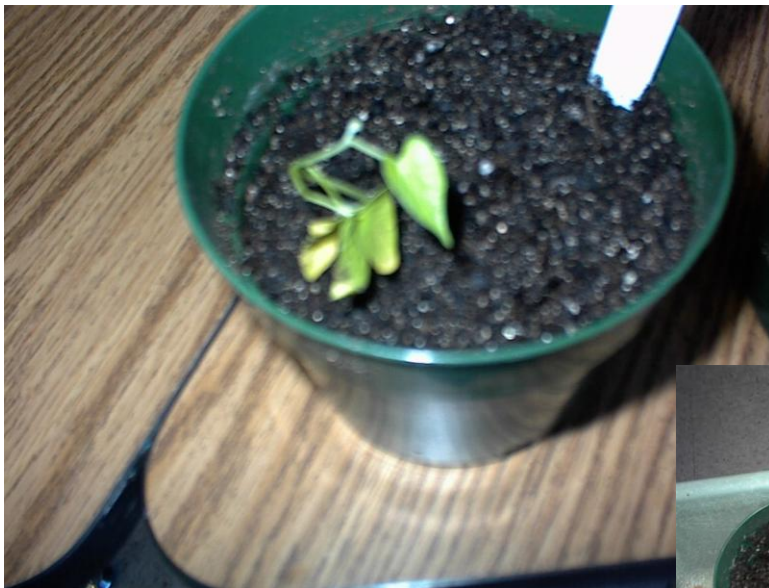
### Part Three:

Put the plants in a sunny window and monitor the changes that take place and help them log their observations.

**Questions to ask:**

What's the difference between the plants outside and the plants inside? What do we need to do to keep them healthy indoors? Why are these potted plants so light green? Do we have too many in a pot? Why did that affect them?

What is in the soil we buy in a bag? What is fertilizer? Will the plant we give too much fertilizer grow as big as the bean stalk in the story Jack in the Bean stalk?





## Tomato Experiment

Ages 4 and up (one 45 minute session)



### Objectives:

- To introduce children to the scientific method.
- To stimulate curiosity
- To learn prediction, observation and data collection,
- To learn to interpret data

### Materials:

10 overgrown tomato plants about 2 feet tall in 4 inch pots.  
Shovel  
10 Stakes  
Small log book and a pencil,  
A scale  
Measuring tape



### Set up:

Dig two trenches 12 feet long approximately 12" deep. Space the trenches 36" apart.

### Part One:

Talk to the children about root growth and nutrient and water uptake. Pull one of the tomato plants out of its pot and show them how crowded the roots are. Explain how if the plants are buried in the ground  $\frac{1}{2}$  way up the plant that roots will grow from the buried stem. Encourage them to speculate on whether that plant will grow better or worse if they planted it that way. Encourage them to think about how they might tell which planting way would be better. Maybe weighing the fruit? Write down their predictions and ideas in the log book and explain it is their experiment data book. Create two groups of tomato plants (5 and 5). Plant one group by just covering the root ball. The second group will be planted with the root ball and half the shoot underground. Put a stake in for each tomato plant. The ones planted to just cover the root ball will need to be tied to the stake immediately so they won't fall over and break. Large twist ties work well but leave lots of room for the diameter of the stem to expand without being constriction.



**Part Two:**

After two or three weeks, sacrifice the end plant from each trench and look at the root growth along the stem and at what happened to the root ball. Count the roots or observe which plant has the most. Throughout the summer keep track of how the plants are doing. Every fruit that is picked should be weighed and the weight recorded. Plant height should be taken periodically and recorded. Is there a noticeable difference?

Revisit the predictions the children made, and discuss which were more accurate.

**Questions to ask:** Everything about roots. Everything about tomato culture. How big were the tomatoes? How many grew on each plant? Why did the shoot grow roots? Were you right in your prediction? Was your reason right? Why do scientists do experiments?

**Activity:**

Make something good to eat from the tomatoes, mini pizzas or salsa. See Reference Section -Recipes.

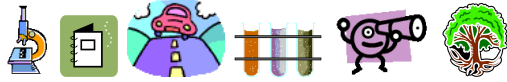
**Read About It:**

*I Will Never Not Ever Eat a Tomato*, Lauren Child, Candlewick, 2003.



## The Power of Light

Ages 4 to 5 (one 25 minute session)



### Objectives:

- To help children understand what the sun does for a plant.
- To show that sunlight physically affects plants.

### Materials:

4 week old transplants  
Potting soil  
Liquid fertilizer  
4 inch pots  
Labels and a lead pencil  
Black construction paper  
Staples and scotch tape



### Set up:

Plant some wheat or oat seeds 4 weeks before the experiment is to take place.

### Part One:

Talk about what plants need to grow (nutrients and sunlight). Introduce the term photosynthesis and what it means. Talk about what might happen to plants if no sun were available for them to use. Have them speculate and write those ideas down in their experiment journal. Have them fill the four inch pots. Have them transplant a single plant into each pot. Mix the fertilizer according to the directions on the box of Miracle Grow, in a glass jug, so the children can see the color change. Talk about what fertilizer is. Water each plant with the fertilizer water.

### Part Two:

Using the black construction paper, help the children construct a tube that can be placed over one of the plants to exclude sunlight. Be sure the tube has one end covered and that absolutely NO light can get in. Wait one week and observe the results. The plant should be considerably lighter green than usual. This plant reaction is called etiolation.

### Questions to ask:

What does the sun do for the plant? When do plants "grow", at night or in the daytime? What do you think photosynthesis means? Why are plants green? What is a chloroplast? What would happen if a plant didn't get any light?

### Activity:

Make some solar tea see Reference Section- Recipes.



Make a solar oven from a pizza box, see Reference Section -You Make It, for instructions.

**Read About It:**

*Reasons for Seasons*, Gail Gibbons, Holiday House, 1996.

*The Spring Equinox*, Ellen Jackson, Millbrook Press, 2002.

*Summer Solstice*, Ellen Jackson, Millbrook Press, 2001

*The Sunny Day Book*, Jane Bull, DK Pub., 2004.

*Sun Bread*, Elisa Kleven, Dutton Children's Books, 2001 (Includes a recipe.)

*Sun Up, Sun Down*, Gail Gibbons, Voyager, 1987.

**Resources:**

*Amazing Sun Fun Activities*, Michael Daley, McGraw-Hill Co., 1998.





## Bug Hunting

Ages 3 and up (one 45-60 minute session)



### Objectives:

- To familiarize children with various bugs or insects.
- To become confident handling insects.
- To learn the concept of good bugs and bad bugs.

(This lesson can be integrated with "William the Worm", Sec 7).

### Materials:

Insect or butterfly nets  
Plastic jars with lids  
Books about insects



### Set up:

Allow children to look and read books about insects. Talk about insect parts and diets. Using the books, show them which insects bite or sting, harm plants, or are good for the garden. Talk about insect mouthparts and talk about how those mouth parts might damage their garden plants. Talk about what is meant by the words "good and bad".

Punch holes in the jar lids so the insects can get air after they're caught.



### Part One:

Take small groups of children out to a field or garden (in our case the alfalfa plot and the pumpkin patch worked well). Ask the children what kind of bugs they would like to catch. Show them how to use the net, and then let them go running after butterflies, grasshoppers, and dragonflies. Help them put the insects they catch into the jars so that they can be examined closely for some time before they are released again. If using William

the Worm, pick up each insect picture one at a time and talk with each child about whether it is harmful or beneficial. Have a child attach it to the good or bad side of William. Set William up in the garden in an accessible place in the garden to use as a reference by the children during the growing season.

### Helpful Hints:



Many children are afraid of bugs, but are willing to go bug hunting. The point is to have them become aware that not all the bugs will bite or sting them. And that some stinging insects are beneficial for plants, e.g. bumble bees and honeybees pollinate many plants; wasps eat other insects in the garden. Some children will catch the bugs and want to let them go before taking a closer look. Encourage a closer examination so that they can tell stinging insects apart from harmless ones, and see different insect's shapes. If you're lucky, you might catch look a likes in the garden like Lady Bugs and Mexican Bean Beetles. Although these two insects are in the same family, one is beneficial, and the other is a pest!

Finding the right type of books on insects makes the hunting part very easy. In books children can see the vast scope of insects in the world, not just the ones found in the backyard. Try **Pests & Diseases the Complete Guide to Preventing, Identifying and Treating Plant Problems**, by Pippa Greenwood, Andrew Halstead, A.R. Chase, and Daniel Gilrein. Dorling Kindersley Publishing, Inc. Put out by the American Horticultural Society, it has excellent pictures, diagrams and information.

**Note:** If your hunting expedition is in a grassy field, make sure to check children well for ticks.

### **Read About It:**

*Backyard Insects*, Millicent Selsam, Scholastic Books, Inc., 1999.

*The Best Book of Bugs*, Claire Llewellyn, Kingfisher Pub., 2005.

*Bumblebee Queen*, April Pulley Sager, Charlesbridge, 2005.

*Firefly Night*, Carol Gerber, Whispering Coyote, 2000.

*The Honey Makers*, Gail Gibbons, Harper Trophy, 2000.

*Ladybug Garden*, Celia Godkin, Fitzhenry & Whieside, Markham, 1997.

*A Ladybug's Life*, John Himmelman, Children's Press, 1998.

*Miss Spider's Tea Party*, David Kirk, Scholastic Inc., 1994.

*Very Busy Spider*, Eric Carle, Philomel, 1995.

*Very Clumsy Click Beetle*, Eric Carle, Philomel, 1999.

*Very Grouchy Ladybug*. Eric Carle, Harper Trophy, 1996.

*Very Lonely Firefly*, Eric Carle, Philomel, 1999.

*Very Quiet Cricket*, Eric Carle, Philomel, 1997.

### **References:**

*American Horticultural Society Pests & diseases: The complete Guide tp Preventing, Identifying,*

*and Treating Plant Problems*, Pippa Greenwood, et al, Dorling Kindersley Pub., 2000. This has excellent pictures, diagrams and information.

*Garden Insects of North America*, Whitney Cranshaw, Princeton University Press, 2004.

*Good Bugs for Your Garden*, Allison Mia Starcher, Algonquin Books, 1995.





## Toad Villas

Ages 3 and up (30-45 minute session)



### Objectives:

- To learn about the benefits of toads and frogs and in our garden.
- To encourage their occupancy in our garden.

Can be used in conjunction with lesson "A Dirty Job".

### Materials:

Clay pots - preferably broken in half.  
Live toads to look at, or great pictures of them.  
Or clay soil and grass clippings to make adobe houses.

### Set up:

If doing adobe houses *Follow the directions from section 2, A Dirty Job.*

### Part One:

Read a book about toads to the children (see list of books below), discuss their needs, likes and dislikes.

### Part Two:

Go on a toad-hunting expedition in the garden, or show children some toads you found previously. Children can hold the toads if they want, making sure that they are gentle. Talk about what toads are doing in the garden. Ask how they think we can make sure the toads stay in the garden. Introduce the idea of making the toads a home.

### Part Three:

Have fun making the toad houses with the children. Have them help you place the houses in the garden, creating a nice shady shelter for the toads. Place a source of water near the house for the toads. A shallow container can be buried and filled up with water to make a shallow pond. Check it often throughout the summer, changing the water at least weekly so mosquitos don't take up residence in it.

### Questions to ask:

How are toads different from frogs? Toads generally have dry, bumpy skin and live on land, while most frogs have moist, smooth skin and live in or near water. Toads have stubby bodies with short hind legs. They walk rather than hop. Frogs are skinny and have long legs. They have strong, webbed hind feet for leaping and swimming. Do toads croak? Yes, both toads and frogs have distinctive songs. That's how they call the females.

### Read About It:

*Frogs and Toads*, Bobbie Kalman and Tammy Everts, Crabtree Publishing Co. 1994;  
*Frogs*, Gail Gibbons, Holiday House, 1994.

*From Tadpole to Frog*, Wendy Pfeffer and Holly Keller, Harper Collins Pub. 1994.

For a children's website on frogs, including pictures and sounds, visit

<http://www.pca.state.mn.us/kids/frogsforkids.html>; for answers to frog questions visit

<http://cgee.hamline.edu/frogs/science/faq1.html#life>





## Investigation of a Caterpillar

Ages 1 and up (one 30 minute session)



### Objectives:

- To introduce children to caterpillars in the garden
- To learn about the life cycle of butterflies



### Materials:

Caterpillars and leaves from the plants where they are found  
Jars with holes in the lid

### Set up:

Look for caterpillars a day or two in advance. Try to collect different types such as Tomato hornworms, Monarch butterfly caterpillars, or inch worms so that children can see the diversity of forms. Keep caterpillars in the jars with holes in the lids with leaves from the plants where they were collected.

### Part One:

Introduce the children to insects through books, exploring the garden on a regular basis, or follow the activity Bug hunting, in section 5. Explain to them that a caterpillar is the immature or "baby" form of a butterfly or moth. Caterpillars cannot harm us. They eat leaves and usually don't cause a lot of harm in the garden unless there are very large numbers of them.

### Part Two:

Bring the caterpillars into the classroom. Stay on the same visual level as the children when introducing the caterpillars, to help reduce the fear of insects that any children may have. Allow children to gently handle the caterpillars, reminding them to keep their hands open and not to squeeze their soft bodies. Using an open hand the children can maneuver the caterpillar to other parts of their bodies. Point out the different parts of the caterpillar: legs, hairs, eyes and segments.

### Part Three:

A great way to continue this activity is to raise a butterfly. A good choice is to use Monarch butterfly caterpillars, which undergo the regular metamorphosis cycle above ground. (Tomato hornworms bury themselves in the ground during their pupal stage). Make sure that the caterpillars

have enough air and provide them with leaves from the plants they feed from (milkweed plants in the case of Monarchs).

**Questions to ask:**

What do the caterpillars look like? (pipe cleaners, sticks, worms). How are the caterpillars different from each other? Why are they different? What does it feel like to have a caterpillar walk on you? What kind of damage does a caterpillar do to plants? What kind of mouthparts do they have? Do the butterflies have the same kind of mouthparts? Do they damage plants as well?

**Read About It:**

- Butterfly House*, Eve Bunting, Scholastic Press, 1999.
- Butterflies in the Garden*, Carol Lerner, HarperCollins, 2002.
- Caterpillar to Butterfly*, Deborah Heiligman, Harper Trophy, 1996.
- Fairy Flight*, Tracy Kane, Light-Beams Pub. 2003.
- Monarch Butterfly*, Gail Gibbons, Holiday House, 1991.
- Very Hungry Caterpillar*, Eric Carle, Hamish Hamilton, 1994.
- Waiting for Wings*, Lois Ehlert, Harcourt, 2001.
- Where Butterflies Grow*, Joanne Ryder, E. P. Dutton, 1989.

**References:**

- The Family Butterfly Book*, Rick Mikula, Storey Books, 2000.
- Monarch Magic!*, Lynn Rosenblatt, Williamson Pub. Co., 1998





## Exploration of Worms in the Garden

Ages 2 and up (many 30-45 minute sessions)



### Objectives:

- To observe worms and learn about their role in the garden

### Materials:

Shovels or trowels

Buckets

Magnifying lens

Worms, worms, and more worms

### Set up:

Before starting this activity look for worms in the garden.

This may require a night search or setting aside worms found in the compost or compost bin.



#### Part One:

Show the worms to the children, preferably outside in the garden. Let them handle the worms gently. Most children love to handle worms. They are very interesting creatures. Explain that worms have **setae** instead of legs. Worms have an anterior (front/mouth) and a posterior (anus) end. Identifying the front of a worm may be difficult, but their **clitellum** is usually closest to the anterior part of the worm.

#### Part Two:

Explain to children that worms have a beneficial role in the garden. They help **aerate** the soil and add natural fertilizer with their castings. They also help to decompose organic material such as grass clippings, leaves and food items put into a compost bin. Why might we want the soil to be aerated and fertilized? A well-aerated and fertilized soil helps plants grow. Let the children explore their own answers through investigations. Garden Crafts for Kids as well as Roots, Shoots, Buckets and Boots have small activities around worms as well as compost bin construction ideas (see our book list).

For more information check out "The Adventure of Herman the Worm" at

<http://www.urbanext.uiuc.edu/worms>

### Questions to ask:

What do worms do in the garden? What do you think the lines are on the worm? What do worms eat? What is a casting? Are worms boys or girls?

### Sarah, Tyler, and Emma Hillary's Conversations while exploring worms

Sarah: Emma Hillary, I have some fancy paper and a fancy pen. I am hoping you can draw me a picture of where worms go when they go under the ground.

Emma Hillary: (begin to draw a long line) this is the worm.

Emma Hillary: (draws a triangle shape)

Tyler: Tell me about this.

Emma Hillary: This is the worm house. This is where they play.

Tyler: They play?

Emma Hillary: Yep. (she begins to draw the two square shapes )

Tyler: Tell me about these.

Emma Hillary: These are worm skates.

Sarah: Worm skates?

Tyler: Worms can't skate; Only people Silly goose

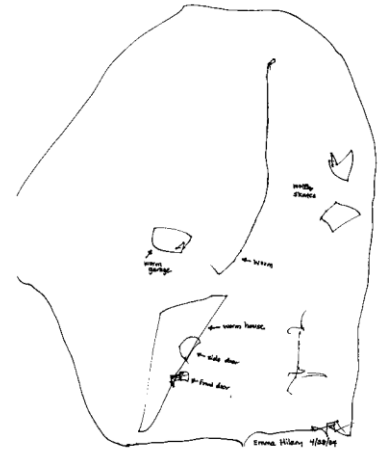
Emma Hillary: They can skate; Worm's skate silly goose.

Tyler: They can't go skating; Silly goose.

Emma Hillary: Silly munchkin

Emma Hillary: I need to door. A door for them. (Two doors-later she explains one is the front door and one is the side door. She also draws a square shape on the left. She later explains that it is a garage.)

Emma Hillary: (Draws a circle around the entire drawing.) They can skate like this. I drew a circle.



Sarah: Tyler I am hoping you can draw me a picture of where the worms go when they go under the ground.

Tyler: (Begins to draw a spiral).

Sarah: Tyler can you tell me about your drawing?

Tyler: I'm drawing, umm (continues to draw).

Sarah: You're drawing what? Tyler: A rainbow. I build a tree

Tyler: (Draws a long line in dots). Sarah: Tell me about this.

Tyler: This is a worm, and these are the people.

Sarah: what people? Tyler: The worm people.

Sarah: I wanted to talk to you about the worm skates again.

Tyler: Worms don't skate.

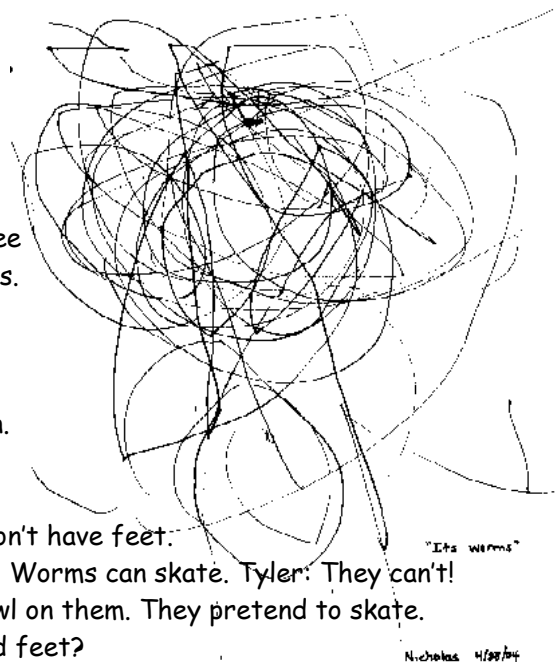
Emma Hillary: But we need to talk about it Tyler.

Sarah: Why can't the worms skate? Tyler: Because they don't have feet.

Sarah: Do you hear what Tyler is telling you? Emma Hillary: Worms can skate. Tyler: They can't!

Emma Hillary: But Tyler, the crawl with skate on. They crawl on them. They pretend to skate.

Sarah: Do you remember what you told me about worms and feet?





Tyler: Skates don't stay on with no feet.

Emma Hillary: Oh.

### **Glossary:**

**Clitellum:** the light colored section or band on the worm's body that secretes a slime that helps a worm move through soil.

**Setae:** tiny hairs on each segment used to move through soil. The setae are the reason it's hard to "pull" worms from soil.

**Aerate:** Add air too.

### **Read About It:**

*Diary of a Worm*, Doreen Cronin, Joanna Cotler Books, 2003.

*An Earthworm's Life*, John Himmelman, Children's Press, 2001.

*Squirmy, Wormy Composters*, Bobbie Kalman, Crabtree, 1992.

*Wiggly Worms at Work*, Wendy Pfeffer, HarperTrophy, 2004.

### **Resources:**

*Garden Crafts for Kids*, Diane Rhoades, Sterling Pub., 1995.

*Root Shoot Buckets & Boots*, Sharon Lovejoy, Workman Pub., 1999.

*Worms Eat My Garbage*, Mary Appelhof, Flower Press, 1982.

*Worms Eat Our Garbage*, Mary Appelhof, Mary Frances Fenton & Barbara Loss Harris, Flower Press, 1993. Classroom activities.

## First Signs of Spring

Ages 3 and up (one 1 hour session)



### Objectives:

- To celebrate the changing of the seasons,
- To help children recognize seasonal change.
- To develop motor skills.



### Materials:

Forced bulbs

Art supplies; scissors, glue, colored construction paper and white poster board

Egg cartons

Soil thermometer

A large nail and hammer or a battery powered drill with a drill bit the diameter of a pencil.

### Set up:

Locate some forced bulbs. ( Around Easter, they can usually be bought in the grocery stores).

Ask the children to bring in egg cartons for the upcoming project. (You may want to send a note home to the parents).

Separate the egg sections ahead of time.

If you don't have daffodils or tulips or crocuses growing right outside, take some pictures of some sprouting and bring in the pictures the day of the activity to show the children. Let them know where they're growing (like at your home)!

### Part One:

If the bulbs are growing right outside, go for a walk with the children to see them. Bring the soil thermometer and check the temperature of the ground. Talk about the soil warming, and the sun getting higher in the sky. Point out the buds swelling in the trees. Talk about everything waking up. If you have a maple tree you could tap that tree and talk about how the sap runs this time of the year. Put a hole in the tree with the hammer and nail, about 3 feet from the soil line, above a large root. Remove the nail. The hole will produce sap if the weather is above 40 degrees, and close back up over night. Talk about how the sap moves up from the roots on warm days and goes back down at night when the temperature gets below 30 degrees again. (a trip to a sap house this time of year compliments this activity).

If you don't have the bulbs right outside to look at, pull out those pictures and then go outside and test the soil temperature and proceed as above.

Ask children if they have noticed any flowers blooming yet and if so, ask them to describe what they looked like and see if they know any names of early spring flowers. Show them the forced bulbs you brought in. Let them pick them and smell them and enjoy them. Pull up a bulb or two and pass it around for everyone to see. Talk about how the bulb is a food storage unit. Liken it to other food storage units (like your refrigerator).

**Part Two:**

Make a daffodil!

First paint an eggcup yellow and set it aside to dry. Next, use a piece of yellow paper to cut out the 5 petals of the daffodil. Cut out a thick green stem and leaves. Glue the stem and leaves to the poster board. Glue the petals to the top of the stem. When the eggcup is dry, glue it to the center of the petals. Many other spring flowers are also fun to make, just let the children use their imaginations.

**Part Three:**

As the children are finishing their creations invite them to talk about their designs and share ideas. It might be fun to use all of the flowers to make a springtime garden for the classroom.

**Questions to ask:**

What is a season? What makes each one special? What is their favorite season and why? What do we mean by "signs" of spring? Can they think of any other signs of spring besides flowers and sap running? What bird is the favorite harbinger of spring? Let them know he has a red breast!

**Read About It:**

*Reasons for Seasons*, Gail Gibbons, Holiday House, 1996.

*The Spring Equinox*, Ellen Jackson, Millbrook Press, 2002.

*Sugar on Snow*, Nan Parson Rossiter, Dutton Children's Books, 2002.



## Creating Paper Flowers

Ages 5 and up (one 45 minute session)

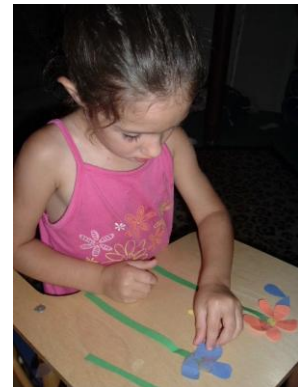


### Objectives:

- To learn the parts of a flower and about pollination

### Materials:

- Lily or other flowers with clear large parts.
- Construction paper in different colors
- Colored background paper
- Markers
- Glue
- Pipe cleaners
- Q-tips
- Anything that can be glued to paper to look like flower parts.
- Smocks



### Set up:

Cut construction paper petals in lots of colors.

Gather and arrange additional art supplies that will be used.

*Note: Lily flowers are a good choice for this activity because they are big flowers and you can see the different parts easily, but it's pollen stains and may not come out of clothing.*

*Other good choices are; male and female flower from a summer or zucchini squash, daffodil, or tulip.*

### Part One:

Start by looking at the flowers with the children. Talk about the different parts and what their function is. Talk about pollination. Use the Q-tips and demonstrate how the pollen would stick to the fuzzy hairs of a bee. Talk about the way they pollinate by accident while looking for food. Talk about what they see.

### Part Two:

Have each child choose a piece of paper to use as background. Have them choose a flower to re create. Then count the number of petals. Compare the number of petals on each flower. Count the number of stamens, and pistils. Talk about plant families. Talk about the layers or **whorls** in a flower. Have them draw a stem and leaves. Pass out paper petals and have them create the flowers. They can add the additional parts with markers, or cut pieces of construction paper or anything else you supplied for them to use. Q-tips make great anthers!

### Questions to ask:



Why do you think some flowers have bright colors or sweet smells? Do you have a favorite flower? What is the color of your favorite flower? Have you ever noticed how many petals your favorite flower has? How many petals does this flower have? What do you enjoy about flowers? What is pollination? Why is it important? What would happen to us if plants weren't pollinated?

**Glossary:**

Whorls: 4 layers(sometimes less) of a flower (calyx, petals, stamens,& pistils).

Calyx = greenish cup structure the petals, stamens, and pistils sit in.

Petals = parts usually colored, like the white segments of a daisy.

Stamens = male pollen bearing parts

Pistils = female egg bearing parts.

**Activities:**

Use the flowers as an inspiration in the art area.

Graph the number of petals.

**Read About It:**

*The Reason for a Flower*, Ruth Heller, Grosset & Dunlap, 1983.



## Making Scarecrows



**Ages 5 and up (3 or 4 30-45 minute sessions to complete)**



### Objectives:

- To add art to the garden,
- To introduce children to alternative pest control methods.

### Materials:

Old clothes,  
A pillowcase for the head  
Leaves, straw, or hay for stuffing,  
Non toxic exterior paint to draw the face  
Hammers and 18 large nails (size depends on the thickness of the wood used)  
(One) 1 x 4 x 72 inch board (for the body)  
(One) 1 x 4 x 17 inch boards (for shoulders and arms)  
*Note: collecting scrap pieces of wood that are relatively the same size as above will work well.*  
String or twine, gloves and safety glasses  
Smocks or clothes that can get dirty  
Staple gun



### Set up:

Cut all the wood pieces, and gather supplies to the garden.

### Part One:

Read some books about scarecrows or show the children pictures of some, to introduce the idea of making one for the garden. Talk about why scarecrows were invented. Talk about what gardeners and farmers do now to keep crows from pulling corn seedlings. See what ideas the children have to remedy the problem. Suggest the environmentally friendly technique of feeding the birds cracked corn until the corn seedlings are too strong for the birds to pull as an alternative!

Have children brainstorm on how they would like their scarecrow to look

### Part Two:

Have the children choose a location in the garden for their scarecrow. Make a cross out of the boards, attaching the 17" board approximately 18" from the top of the 72" board to create a neck. Allow the children to help you nail the parts together. After the pieces are put together, push it in the ground and start the creation of their scarecrow.

**Note:** *If pants are used, cut a hole in the crotch large enough for the cross to pass through and put them on the cross before you push it in the ground.*

**Part Three:**

Paint a face on the pillow case and let dry. Have the children choose clothes. Tie the ends of the pant legs and stuff. Staple the waist to the board. Tie the cuffs of a shirt closed, and stuff them. Put the shirt on the cross, button it up, tie the waist, and stuff it. After the face is dry, Construct the head with a pillowcase stuffed with leaves, hay, or straw. After stuffing to the desired size, tie the end closed over the neck. Hats, ribbons, hair, gloves, shoes, and belts can all be added now for character.

**(Adapted from Garden Crafts for Kids: 50 Great Reasons to Get Your Hands Dirty by Diane Rhoades)**

**Read About It:**

*Feathertop*, Robert San Souci, Yearling Pub.,1995.

*Rosebud and Red Flannel*, Ethel Pochocki, Down East Books, 1989.

*Scarecrow*, Cynthia Rylant, Voyager Books, 1998.

*Scarecrow Pete*, Mark Kimball Moulton, Ideals Press, 2005.

**Resources:**

*Garden Crafts for Kids: 50 Great Reasons to Get Your Hands Dirty*, Diane Rhoades, Sterling Pub., 1995.)

*Scarecrows. Making Harvest Figures and Other Garden Folks*, Felder Rushing, Storey Books, 1998.



## Stepping-Stones

Ages 2 and up (one 30-45 minute session)



### Objectives:

- To create a sense of ownership by adding artwork to the garden,
- To learn about soil compaction

### Materials:

Cement or Concrete  
Something to mix cement with and in;  
Like a wheelbarrow  
Aluminum baking pans or pie tins  
in various sizes  
Crisco  
Natural objects to imbed in the concrete  
Smocks, disposable gloves, containers  
for measuring water, and paper towels.



### Set up:

Fill the water containers with the correct amount of water to mix one bag of concrete, following the label directions. Open the Crisco. Assemble various piles of objects to imbed.

**Note:** Put one bag of concrete in the wheelbarrow before the kids come out. It is very dusty and may aggravate the lungs of an asthmatic child. If more than one bag will need to be mixed, make sure none of the children are standing too close or down wind when the bag is dumped. Mix only one bag at a time. When the children are handling the concrete, make sure they are wearing gloves. Concrete is very alkaline and will burn their skin if it is exposed to it for any length of time.

### Part One:

Assemble the children at the garden and talk about the plants roots and the importance of loose soil. Talk about how their feet compact the soil. In loose soil, let them make foot prints. Discuss how they might avoid compacting the soil and introduce the idea of making stepping-stones. Explain how they can make the stepping-stones. Show the children the items they will be using for creating the stones and the objects that will make them works of art for their garden. Before starting make sure that children are wearing smocks or old clothes, and wearing gloves.

### Part Two:

Have some of the children grease the pans with Crisco and paper towels to keep the concrete from sticking. Have another group of children assist in mixing the cement. Some of them can pour the pre measured water into the wheelbarrow on your Q while others help you mix with the shovel or hoe. Be certain to scrap the bottom of the wheelbarrow to incorporate ALL of the cement dust.



### **Part Three:**

Have everyone choose a mold to use, and pour the cement into each of the tins or plastic molds. Have the children push items firmly into the cement. Explain the items can't stick up too far or they may cause someone to trip when they walk on them. Have them add their glove covered hand or foot prints to their creations. Allow the stepping stones to dry for two days. After the first day, the stepping stones can be taken out of the molds and flipped over for the bottom to dry. *(At this point children can write their names on their stones by scratching them on the bottom using a pencil).*

Place the stepping stones in the garden, forming a path around plants; or place them in an unplanted spot and have the children press Alyssum or some other low growing annual around them. Everyone take a walk on the path and admire the beauty of the children's creations.

### **Questions to ask:**

Why is it important to have a path in the garden? Besides soil compaction, what other benefit do stepping stones bring to the garden? Why do beneficial insects like to hide under the stepping-stones during the day?



## Flower Pressing

Ages 3 and up (many 30-45 minute sessions)



### Objectives:

- To expand plant use knowledge by drying and using them in winter artwork projects,
- To re-enforce plant part recognition concepts (flowers, leaves, roots, stem, etc.)

### Materials:

Collected flowers and leaves

(4) 1"x10"x24" boards

Drill and 1" spade bit

Corrugated Cardboard

Blotting paper or paper towels,

Newspaper

Two old belts or straps, or heavy rope, at least 6 feet long.



### Set up:

Create a Swiss cheese appearance in all 4 of the boards by drilling holes approximately every 2" with the spade bit. Cut several pieces of cardboard and blotting paper 24" long. Have the children bring in newspaper.

### Part One:

Have children pick flowers and leaves from the garden or during a field trip outside. Wildflowers, grasses and ferns dry well. Find a place in the classroom that the flower press can be left for two weeks. Lay two of the boards side by side on the two straps. (The straps will eventually

be tied or buckled to hold the board newspaper sandwich together). \* Put a piece of cardboard on the boards, then a piece of blotter paper or paper towels, then several sheets of newspaper. Have the children place their plant in between the newspaper pieces. Add a piece of blotter paper then a piece of cardboard. Continue from the \* until the plants are all sandwiched. Put the remaining boards on top. Buckle or tie the sandwich together. Have a child sit on it when you are tying or buckling it to press it down firmly

### Questions to ask:

Talk about the parts of a plant: flower, stem, leaves, etc. What will we dry our plant for?



## Still Life Painting

Ages 2 and up (one 45 minute session)



### Objectives:

- To practice observation skills.
- To learn about flower anatomy.

### Materials:

Flowers or plants from the garden  
Colorful paint - tempera or watercolors and paint brushes  
Easels  
Smocks

### Set up:

Have the children help pick flowers and plants from the garden to paint. Revisit the different parts of a flower calling attention to the fine details like anthers. Call attention to any insects that may be in the flowers when they pick them. Talk about pollination. If you have a jar, catch a bug or two to bring inside to add to the paintings.



### Part One:

Set up the easels with paper. Have all the colors out and ready for use with paintbrushes and water. Arrange the flowers in a pleasing way and in a convenient way for the children to view as they paint. Make sure all the children are wearing smocks.

### Part Two:

Have the children begin painting. Remind them of the details in the flowers and the bugs they saw when they were in the garden. As they paint, talk with them about what they are painting. Have them show the various parts of the flowers such as the stem, sepals, anthers, etc.

### Part Three:

Display the wonderful paintings for all to see. Have a lovely art exhibit outside (weather permitting) with the children's pictures next to the actual flowers growing.

### Read About It:

*Camille and the Sunflowers: A Story About Vincent Van Gogh*,  
Laurence Anholt, Barron's Educational Series, 1994.

*Charlotte in Giverny*, Joan MacPhail Knight, Chronicle Books,  
2000.

*Linnea in Monet's Garden*, Christina Bjork & Lena Anderson, R & S Books, 1985.

*The Magical Garden of Monet*, Laurence Anholt, Barron's, 2003.





## Garden Storybook

Ages 4 and up (multiple 45 minute sessions)



### Objectives:

- To create a lasting memory of the garden.
- To gain experience in documentation,
- To train their eye toward details,
- To learn to recognize the story in everything.

### Materials:

Colored pencils  
Sketch paper



### Part One:

Periodically throughout the summer, have the children sketch what the garden looks like. Try to have them draw what they see with the idea that they will be putting together a storybook of how their garden grew. The collection of pictures will create a document of the process the children went through, and will show them how the garden has grown over the summer.

### Part Two:

Once the children have drawn the garden, the next step is to have them write the story of how they made their garden and the various things they did throughout the summer. Brainstorm all the activities they did and what they planted. This is a fun way to create a special memory of their experiences in the garden. Type up the story and bind all the pictures together to make a book written and illustrated by the children.







## "The Magic Can"

Ages 3 and up (one 20-30 minutes session)



### Objectives:

- To sharpen our listening skills
- To wait patiently until it is our turn.

### Materials:

Coffee can with lid  
Natural objects (e.g. leaves, sticks, acorns, pinecones, Crabapple fruits, feathers, stones, flowers, seeds, Seed pods)



### Set up:

Paint the transparent lid of the coffee can with a dark paint or paste a circle of paper cut to size.

### Part One:

For the first round of play, the teacher must secretly put an item into the "Magic Can". Sit around in a circle. Explain to the children that there is something inside the "Magic Can" that came from the garden or woods outside the classroom. They have to guess what is inside without opening the can. As they pass the can around, each child can shake the can and listen to the sound it makes. He or she can ask one question about the item then make one guess as to what it is. If the guess is incorrect, pass the can to the next child in the circle.



### Part Two:

When a child guesses what the item was, he or she can choose the next item and place it in the "Magic Can" without the others seeing what it is. Repeat the above procedure. This child is now responsible for answering questions about the item.

### Questions to ask:

What does it sound like? What does it feel like? Is it soft, hard, sticky, alive? Is it heavy or light? Which item was the hardest to guess? Why? Which one was the easiest?

(Adapted from Ohio State 4-H Cloverbud program)



## William the Worm



**Ages 3 and up (two 30-45 minute session)**



### Objectives:

- To familiarize children with various insects found in a vegetable or flower garden and clarify the terms "Good" and "Bad" bug.
- To learn about worms and their role in the garden,
- To understand the need for insects in our environment,
- To learn basic insect identification,
- To introduce children to control option concepts and talk about environmental impacts.

*(This activity can be used in conjunction with Sec 5.1 & 5.4).*



### Materials:

2x8 sheet of  $\frac{3}{4}$  inch exterior plywood - primed

Latex paint of various colors

Jig saw

Lots of pictures from magazines or books of beneficial insects and harmful insects

Laminating sheets and a laminator.

Thumb tacs

Reference books about beneficial insects and harmful insects (see the book list).

Materials for a stand - pressure treated

Small plastic clear jars or bottles for trapping and observing insects.

**Note:** (If William is not to be left in the garden to use as a reference guide, He can be made by you and children on a large piece of paper and colored with crayons. Because of the need for a happy and sad side, maybe two worms can be made and places side by side. (William and Wanda worm)? Also, the pictures to attach wouldn't need to be laminated and could be affixed with tape instead of thumb tacs).

### Set up:

Prime both sides of the plywood with exterior primer. When it's dry, free hand the shape of a large worm with pencil and cut the shape out with a jig saw. Prime the cut edges. Paint both sides of the worm. Make the face on one side with a smile, and the face on the other with a frown.

Find many pictures of beneficial garden insects and cut them out of magazines or scan them from books. Laminate them.

Make a stand for William to stay in throughout the summer in the garden.

### Part One:

Follow the activity directions in Section 5.4 and learn all about worms.

### Part Two:

Assemble the children, laminated pictures, and the reference books on a picnic table or blanket near William. Tell Williams story, by Dot Perkins: [William is a worm that lives in the garden. As we know, worms live mostly underground but sometimes come to the surface. They are good for our gardens. When William comes to the surface he sees many different insects. He was told never to speak to insects who weren't friends of the garden but William wasn't shown who was bad and who was good. How can he find out who he should be friendly with? He needs your help!] Allow the children to go through the laminated pictures and show them the happy face on one side of William and the sad face on the other side. Explain they will put the laminated pictures on one side or the other with the thumb tacs so William can use the picture to distinguish who is good and who is bad. Start going through the reference books and find the insects, talk about why each one is good or bad and discuss what we mean by "good" or "bad". Have them all involved in the discovery and explanation of each insect. Have them take turns putting insects on William.

### Part Three:

Place William in the garden in a spot that is easily accessible so the children can use him as a reference when they find insects in the garden. Pass out the plastic bottles and go on a bug hunt. Have the children look up the insects they've found on William to see if it's good or bad. Talk about control options and the benefits and disadvantages of each kind.

### Questions to Ask:

What kind of insect creates a caterpillar? Are the adults harmful to our plants? What do the caterpillars look like? How are the caterpillars different from each other? What is the difference between the adults and the larva? What does larva mean? What kind of mouthparts do caterpillars have? Why are chewing mouthparts bad in our garden? What kind of mouthparts does an aphid have? Why is that bad? Do these insects have wings? What kind of insect eats aphids? What do their babies look like? How do we know it's a beetle? Where do we find these eggs? Do we need to get rid of insects everywhere in the world or just from our gardens? Why don't we want to get rid of all the insects everywhere? Why is a wasp a good bug?









## Greenhouse Trip

Ages 3 and up (one 1 - 1½ hour session)



### Objectives:

- To learn the difference between environmentally controlled growing and outdoor growing.
- To sow seeds for the children's garden

### Materials:

Peas, beans, and sunflower seeds  
Potting media (soiless potting mix)  
Four-inch pots or six packs  
Plastic containers from ready-made salads (when turned upside down, they resemble little greenhouses).  
labels



### Set up:

Arrange a trip to a university greenhouse, commercial greenhouse, a botanical garden, or conservatory in your area. Some gardening centers have their own children's gardening club and could be a good option if a greenhouse trip can't be arranged. (Contact your local Cooperative Extension for ideas). Arrange to have a guided tour and do planting activities at the greenhouse. If planting isn't possible at the greenhouse, plan to sow seeds at school after the trip in the salad containers. If the greenhouse tour is timed to coincide with garden planting, transplants can be purchased by children.

### Part One:

Before the trip or on the way to the greenhouse, explain that in a greenhouse we control the temperature, light and moisture so that it is optimal for plants' growth. As the tour progresses instruct the children to take a close look of the greenhouse. Call their attention to the fans, windowpanes of glass, lights, and benches. Talk about plants to use in their garden.

### Part Two:

Bring the children to the area where they will be doing the planting activity. Explain that they will be planting seeds for their new garden. Have a station where children can choose their seeds, and get their pots and soil. (This way all children will be busy and not waiting around to plant their seeds). Demonstrate how to sow the seeds and show children the depth at which the different seeds should be planted, following the directions on the seed packets. In our field trip children were encouraged to plant as many pots as they wished and to help others by handing out seeds, pots and cleaning up.

**Questions to ask:**

What did they like the best about the greenhouse? What is special about growing plants in a greenhouse? Did they see any plants in the greenhouse that they would like to have in their garden? Can they point out things that are different from a garden? What is the same?



## Farm Tour

Ages 3 and up (one 1 - 1½ hour session)



### Objectives:

- To realize the farm and the farmer as the producer of food.

### Materials:

Transportation (if needed)  
Water bottles, sun hats and sunscreen  
Sneakers or other hiking shoes  
A camera.

### Set up:

Contact a local farm. Many farmers are willing to give tours of their operations. Ask what the children would be able to do while visiting (e.g. pick produce, pet the animals, look at tractors and equipment, explore barns, etc.) Think safety first and relay that information to the children.



### Part One:

Introduce the children to the Farmer. Allow the Farmer to explain the farm activities, while encouraging children to ask questions.

### Part Two:

If possible, have the children examine the planted plots, tractors and other machinery. Depending on the type of farm and season, apple, peach or other fruit and vegetable picking may be possible. Most children are curious about the tractors: how they work, what they're used for, or if it be hooked up to other pieces of machinery to do specific jobs. Barns are great places to find many interesting pieces of farm equipment or

animals.

### Part Three:

A picnic lunch on the farm might also be a fun ending to the visit. Bring all the children together to discuss what they saw and did on the farm. Have them write a thank-you note to the farmer. Include their favorite parts of the trip. It will bring joy to both the children and the Farmer.

**Questions to Ask:** What crops are grown at the farm? What crops are being harvested today? Does the farmer just grow plants for people or do they also grow plants for their livestock? What does the word livestock mean? Do they produce any animal products? How does the produce get from the farm to the grocery store? Who puts it in those plastic wrappers? Do they think that being a farmer would be fun? Does it look like a lot of work?



## A Salad Party

Ages 4 and up (one 1 hour session)



### Objective:

- To make a connection between themselves and the food chain.
- To enjoy the fruits of their labor and the garden.

### Materials:

Vegetables for the salad, oil and vinegar, bowls, forks, salt and pepper.  
Poster board and markers  
Magazine pictures of animals and plants.



### Part One:

Using the art supplies and the magazine pictures, help the children create the cycle of life on the poster board. Start with plants capturing energy from the sun and using nutrients from the soil create another source of energy that everything else on earth depends on to live. Don't forget to talk about the by product of this energy production. Add pictures of the animals in order of the food chain. Start with those that eat plants, then others that eat the plant-eaters, and finally the ones that eat both plants and animals. Show how when these organisms decompose, urinate, and defecate they provide nutrients for the plants which bring the life cycle full circle. Emphasize what each plant or animal or insect uses as its energy source and draw an arrow to it showing the roll of all creatures in the cycle of life.

### Part Two:

Pick salad vegetables from the garden with the children.

Wash the vegetables and prepare the salad with the children.

Find a cozy place to sit in the garden, and Eat! Discuss what part of each plant they are eating, and how the process of eating connects them to other plants and animals.

**Questions to ask:**

When the children eat the salad, where are they on the food chain? What are the children's' favorite foods? Are they herbivores, carnivores, or omnivores?

**Read About it:**

*The Cabbage Soup Solution*, Erika Oiler, Dutton Children's Books, 2004.

*Cucumber Soup*, Vivki Leigh Krudwig, Fulcrum Pub., 1998. (Includes a recipe)

**Resources:**

*The Edible Salad Garden*, Rosalind Creasy, Periplus Pub., 1999.

*Four Season Harvest*, Eliot Coleman, Chelsea Green, Pub., 1999.

*The Organic Salad Garden*, Joy Larkcom, Frances Lincoln, 2001.

*Super Salads*, Mark Icanberry, Look, Learn & Do Pub., 2000.



## Fruit Basket Investigation: Where is the seed?



Ages 3 and up (one 1 hour session)



### Objectives:

- To explore the difference in fruits,
- To understand why plants produce fruit

**Make sure to find out about allergies and special eating needs of the children before selecting the fruits and beginning this project.**

### Materials:

Various types of fruit with different types of seeds, for example pitted fruits (peach, plum, apricot), citrus (lemon, orange, mandarin), a pear or an apple (which when cut across has a star-shaped section holding the pips), seeded watermelon, some type of berry, tomato, pepper, avocado.

The flower head of a dandelion or a grass, and a whole coconut if available.

Cutting board and a sharp knife for the teacher to use.

A large bowl for the fruit salad bowls and forks, paper towels to dry the seeds on so that children can examine them.

### Part One:

Pull each fruit out of a shopping bag while asking children to identify it. Ask them to share any thoughts they might have such as whether the fruit is sweet or sour, where and on what type of plant they might find it growing. Have them group the fruits. Let them choose their own categories. Help with this by giving them ideas such as: fruits containing one or many seeds; fruits that are hard or soft fruits, etc.

### Part Two:

Ask children where they might find the seeds of the various fruit. Slice each fruit, one by one, focusing on finding the seeds. Cut them into bite-sized pieces to make a fruit salad. Examine the seeds. Set the different seeds aside so the children can investigate them again later, after they have dried. Serve each child a bowl of the fruit. Enjoy!

### Questions to ask:

Why do plants produce fruit? Delicious fruits are eaten by birds and animals, which then discard the seeds on the ground, or distribute the seeds in their feces. The fruit or manure provides nutrients for the young seedlings to grow.

Why are some fruits not soft? Some seeds are distributed by the wind (e.g. dandelion, grasses) or water (e.g. a coconut which can float in water).

**Read About It:**

*Apples*, Gail Gibbons, Holiday House, 2000.

*Blackberry Stew*, Isabell Monk, Carolrhoda Books, 2005. (Includes recipe)

*The Berry Book*, Gail Gibbons, Holiday House, 2002.

*Dandelions*, Mia Posada, Scholastic Books, 2000.

*The Gazebo*, Ethel Pochocki, Down East Books, 2002.

*How to Make an Apple Pie and See the World*, Marjorie Priceman, Dragonfly Books, 2001.

*Johnny Appleseed*, Steven Kellogg, Morrow Junior Books, 1988.

*Maine Marmalade*, Ethel Pochocki, Down East Books, 2004.

*Making Plum Jam*, John Warren Stewig, Hyperion Books for Children, 2002. (Includes a jam recipe)

*Our Apple Tree*, Gorel Kristina Naslund, Roaring Brook Press, 2005. (Includes a recipe for Apple Crisp.)

*Pie in the Sky*, Lois Ehlert, Harcourt, 2004. (Includes a recipe for cherry pie.)





## The Gardening Timetable

This general timetable has been designed to help you plan the many gardening activities, and other projects described in the [UNH Growing a Green Generation](#) series. Many specific activities listed can be spread out throughout the summer as you work with the children in the garden while others are quite suitable to do during the fall and winter months.

Because we planned and carried out the Growing a Green generation activities in Durham, New Hampshire, the timetable below is most appropriate for the Seacoast region of the state. Most New Hampshire gardeners can count on a 120 –day growing season, although this number can vary as much as 15 days, one way or another, depending on the specific location and the microclimate of the garden site. To calculate the length of your growing season, count the number of days between the last frost in spring and first killing frost in the fall. If you don't know the average frost dates in your area call the UNH Cooperative Extension office in your county. You can find the phone numbers on the Extension web site:

<http://ceinfo.unh.edu>

### The Timeline:

#### November thru January:

What they are and how they grow (Section 1).

- Begin discussions and experiments about plant growth and development. Take this opportunity to show the children details you wouldn't have time to show them during the busy growing season.

#### February:

Time to get started (Sections 2.2, & 3).

- Begin discussions about the garden. E.g. Size, shape and design.
- Go through various seed catalogs and talk about such things as: days to maturity, soil and light requirements, germination requirements, what you can do with a particular plant or fruit, resistance to pests and diseases etc.
- Order your seeds. (See table 1).

#### March and April:

- Start seeds now. Some seeds need to be transplanted 6 to 8 weeks before the last frost date or the "all safe day" May 30th. Others will need to be started 4 to 6 weeks ahead. Read the packets and plan accordingly. (See tables 2, 3 & 4).

- Start transplanting your seedlings into six packs as soon as the 1<sup>st</sup> set of true leaves appear. Talk to the children about the vascular system and photosynthesis. You can talk about how the seed leaves are all used up now and, how the soil and sun have taken over the job of feeding the plant. Do some experiments proving the need for nutrients. (Section 8).

### **May:**

Wake up your garden remembering never to work overly wet soil.

- Contact your county extension office for information on doing a soil test. Collect a sample from your garden with the childrens help and talk about why you are testing the soil.
- Rototill the garden, mixing in compost and fertilizers following your soil test recommendations. Share what you are doing with the children and have discussions and do activities associated with soil characteristics and fertility (section 2.5).
- Start hardening off your transplants by putting them outside in a sunny, sheltered location. Bring them in on nights (or days) that are predicted to go below 35 degrees.
- Take a trip to a greenhouse (section 4.1).
- Talk about growing things in soil less media vs their garden soil.
- What's the same and what's different about greenhouse growing?
- Continue with your seeding schedule.
- Seeding outdoors can begin now. Remember most garden vegetables require soil temperatures of 45 degrees or more to germinate. (See table 3).
- Create the **hardscapes** for the garden i.e. Teepees, Bean tunnels, cherry tomato houses (Section 3). Use your garden design to place them in the perfect spot!

### **June:**

- Transfer the plants you grew inside out into the garden. This may continue for a few weeks.
- Container gardens can be started now (sections 3.3) so each child can have their own little garden to care for throughout the summer. It will teach them responsibility.

- Begin mulching chores (sections 2.7, 2.8, and tables 5 & 6). Continue these chores throughout the month as you finish planting.
- Get your irrigation method worked out and set up. Topic of discussion? Water needs and conservation.

### **July:**

At this point the garden should be all planted. To have a constant supply of some favorite veggies throughout the summer;

- Successively plant peas, beans, lettuce and other plants that mature in a relatively short time.
- Weeding chores need constant attention now.  
Get a weeding and watering schedule sign-up sheet circulating so you'll have the help when you need it.
- Start taking walks through the garden with the kids to see "who's" emerging from beneath the soil, and to talk about how the transplants are doing.
- Scout for insects, especially cucumber beetles which seem to emerge as soon as the cucurbits break through the ground. Talk about control methods, beneficial and harmful insects. (All of sec. 5 and 9.2).
- Stake or tie the tomatoes.

### **August, September and October:**

- Continue to weed and scout for insects but add diseases to the list. Talk to the kids about diseases and their control. See if you can get a local plant doctor or entomologist to come for a visit. Call Cooperative Extension for help with this.
- As plants start to ripen, be ready to begin harvesting the fruits of your labor. This will continue throughout the rest of the summer.
- Let some of the veggies go to seed and save them for use in activities during the winter months. (See table 4).
- Start pulling spent plants out of the garden and add them to the compost pile.

- Re-till the garden when you're done cleaning it up, and plant a cover crop. Talk about putting back into the soil everything you used during the growing season.

For any gardening questions and help, contact the UNH Cooperative Extension - Family Home and Garden Center, Monday - Friday, 9am to 2pm, toll free at 1-877-xxx-xxxx. You can also contact your local County Cooperative Extension office. The phone numbers for all the county offices can be found on the web site, [ceinfo@unh.edu](mailto:ceinfo@unh.edu)



## Vegetable Seed Planning Chart

Vegetable	Seed or Plants for a 50 ft row	Distance between rows in inches	Feet of Row per Person	Spacing Between Plants in Inches
Beans	4 oz.	18	20-30	2
Beets	½ oz.	12	10-15	2-4
Broccoli	25 plants	24	5 plants	12
Cabbage	25 plants	24	10 plants	12-18
Cauliflower	25 plants	24	5 plants	14-18
Carrots	1/8 oz.	12	10	1-3
Corn	1 oz.	24	25'	12
Cucumbers	¼ oz.	48	10-15'	12
Eggplant	25 plants	24	5 plants	18
Kale	1/8 oz.	18	12	18
Lettuce	1/8 oz.	15	5-10'	12
Muskmelons	12 plants	48	3 plants	12
Onions	1 lb. sets	12	10-20'	2-4
Peas	8 oz.	24	50-100'	2
Peppers	33 plants	18	5 plants	12-18
Potato	33 plants	30	50'	12
Pumpkin	¼ oz.	60	1 hill	36
Radishes	½ oz.	12	5'	1-2
Spinach	½ oz.	15	20'	2-4
Summer squash	¼ oz.	60	1 hill	24
Swiss chard	¼ oz.	18	5'	2-4
Tomato	12-15 plants	30	5 plants	18-24
Turnip	¼ oz.	15	10'	2-6
Watermelon	30 plants	72	2-3 hills	24-48
Zucchini	¼ oz.	60	1 hill	24

Adapted from Garden Way Publication.

## Planting times in Relation to Frost

<b>Hardy-</b>	<b>Semi-Hardy</b>	<b>Tender</b>	<b>Very Tender</b>
Beet	Cauliflower	Snap Bean	Cucumber
Broccoli	Potato	Sweet Corn	Eggplant
Cabbage		Tomato	Muskmelon
Chard			Pepper
Carrot			Pumpkin
Kale			Squash
Lettuce			Watermelon
Onion			
Pea			
Radish			
Spinach			
Turnip			

### Definitions:

**Hardy:** Plant as soon as ground can be prepared, can withstand cold temperatures with little or no mulch.

**Semi-Hardy:** Plant 1-2 weeks before average date of last frost, can withstand moderately cold temperatures, mulch.

**Tender:** Plant 1 week after date of last frost, may withstand very mild frost.

**Very Tender:** Plant 2 weeks after average date of last frost, cannot withstand frost.

## Average Seed Storage Times

<b>Dependable 1 Year</b>	<b>2 or 3 Years</b>	<b>4 or 5 Years</b>
Onion	Peas	Beets
Sweet Corn	Beans	Cabbage
Parsley	Carrots	Cauliflower
Parsnips	Peppers	Cucumber
		Eggplant
		Lettuce
		Muskmelon
		Pumpkin
		Spinach
		Squash
		Turnip
		Tomato
		Watermelon

## Germination & Soil Temperature

<b>Crop</b>	<b>Minimum, °F.</b>	<b>Optimum Range, ° F.</b>	<b>Optimum, °F.</b>	<b>Maximum, °F.</b>
Bean	60	60-85	85	95
Beet	40	50-85	85	95
Cabbage	40	45-95	85	100
Carrot	40	45-85	80	95
Cauliflower	40	45-85	80	100
Celery	40	60-70	70*	85*
Swiss chard	40	50-85	85	95
Corn	50	60-95	95	105
Cucumber	60	60-95	95	105
Eggplant	60	75-90	85	95
Lettuce	35	40-80	75	85
Muskmelon	60	75-95	90	100
Onion	35	50-95	75	95
Parsley	40	50-85	75	90
Pea	40	40-75	75	85
Pepper	60	65-95	85	95
Pumpkin	60	70-90	95	100
Radish	40	45-90	85	95
Spinach	35	45-75	70	85
Squash	60	70-95	95	100
Tomato	50	60-85	85	95
Watermelon	60	70-95	95	105

\* Daily fluctuation to 60° or lower at night is essential.

## Problems & Solutions

<b>Problems</b>	<b>Possible Causes</b>	<b>Possible Solutions</b>
Dying young plants	Fertilizer burn	Mix fertilizer thoroughly with soil. Follow label directions carefully.
	Disease(damping-off)	Identify; treat seed, don't over-water
Stunted plants Pale to yellow	Low soil fertility	Soil test for fertilizer Recommendation.
	Low soil pH (too acid)	Soil test for lime Recommendation.
	Poor soil drainage	Raise beds; add organic matter, adjust irrigation schedule.
	Shallow or compacted Soil	Plow deeper.
	Insects or diseases	Make positive identification; use control measures.
	Nematodes	Soil test for treatment Recommendations.
Stunted plants Purplish color	Low temperature	Plant at recommended time.
	Lack of phosphorus	Add phosphorus fertilizer.
Holes in leaves	Insects	Make positive identification; use control measures.
	Hail	None
Leaf lesions and spots (irregular patterns)	Disease (bacteria or fungus)	Identify, spray or dust, use resistant varieties if available.
	Chemical burn	Follow label directions carefully.
	Fertilizer burn	Keep fertilizer off plants.
Wilting plants	Dry soil	Irrigate
	Excess water in soil	Drain; raise beds; water less frequently
	Nematodes	Soil test for treatment recommendations.
	Disease	Use resistant varieties if possible
Weak, spindly plants	Too much shade	Follow planting site recommendations.
	Too much water	Adjust irrigation schedule
	Plantings too dense	Seed at recommended rate; thin
	Too much Nitrogen	Soil test; follow recommendations
Failure to set fruit	High temperature	Follow recommended planting time.
	Low temperature	Follow recommended planting time or use season extenders
	Too much nitrogen	Soil test; follow recommendations
	Insects	Make positive identification; follow control recommendations.
Tomato leaves curl	Heavy pruning in hot weather	Avoid heavy pruning above 4 <sup>th</sup> flower cluster.
	Disease	Make positive identification; follow control recommendations.

<b>Problems</b>	<b>Possible Causes</b>	<b>Possible Solutions</b>
Blossom ends rot	Low calcium	Soil test; lime accordingly
	Irregular watering	Adjust irrigation schedule to fit soil moisture conditions
	Poor pollination	Plant crops to attract pollinators and beneficial insects; hand pollinate
Misshapen tomatoes (cat facing)	Cool weather during bloom	Follow recommended planting time or use season extenders.
Distorted leaves; abnormal growth	2,4-D weed killer	Have separate sprayers for herbicides and pesticides. Avoid spray drift; don't spray on windy day. Apply 2,4-D according to label directions.
	Virus disease	Make positive identification; follow control recommendations.

## Mulching Materials-Pros & Cons

<b>Material</b>	<b>Pro</b>	<b>Con</b>
Straw/Hay	Cheap; generally available; adds organic matter	Can contain weed seed, insects and /or disease
Leaves	Readily available; generally free; rich in nutrients	Can mat down if not shredded, increases acidity in soil.
Grass clippings	Easy to get and apply; good source of nitrogen if applied green (green manure).	Can burn plants if applied green; may contain weed seeds
Pine needles	Attractive; easy to apply	Increases soil acidity
Wood shavings	Weed and disease free; easy to apply; available	Can be acid; decomposition process ties up nitrogen in the soil
Newspaper	Easy to get and apply; earthworms love it	Decomposes very fast; must be weighted down, unattractive
Black Plastic	Total weed control; warms soil for early start; heavy plastic can be used more than one season	Expensive, unattractive; adds nothing to soil; must be weighted down and cleaned up in the fall.

For more information contact your county Cooperative Extension Office. Phone numbers can be found on their web site. [ceinfo@unh.edu](mailto:ceinfo@unh.edu).



## Cultivation and Care Tips

**Cultivate early.** The best way to kill a weed is with a hoe on a hot dry day when they are in white thread stage. White thread stage is right after they've sprouted. Don't disturb more than the top 2 inches of soil. Every time you disturb more than the top 2 inches of soil you expose weed seeds to light which will stimulate their germination. Leave that weed bank alone.

**Don't weed right after a rainstorm.** Weeds left on moist ground will re-root. Wait until the soil is workable and dryer.

**Thin ruthlessly.** If your beets, carrots, or lettuce are to grow well, they must have room. Leave enough space between plants so they can mature easily.

**Stay out of a wet garden.** Fungal diseases are easily spread when plants are wet. Even heavy dew is considered wet enough to spread disease.

**Water the ground, not the plants.** Fungi need moisture to infect and thrive. Bacteria need moisture to flourish and spread. Apply water to the base of the plant at sunrise or before noon, so the heat of the day will dry leaves that may have gotten wet. Never water at dusk.

## Plants and Their Use

### Plants for the senses

Various mint plants: Come in all smells from lemon to chocolate.

Scented Geraniums: Come in all smells from nutmeg to roses.

Plants from the primrose family: Their seed pods make rattles.

Thistles have various prickles some not too sharp but good for learning about.

Nasturtiums are brightly colored and edible; they have a peppery taste.

Hares tail grass (*Lagurus ovatus*): Very soft to the touch and non invasive. Its a clump grass.

Snap dragons have a dragon mouth when you squeeze the flower.

Chives smell like onions.

Stevia (*Stevia Rebaudiana*): Sweeter than sugar and can be used as a substitute.

Spilanthes oleacea (Toothache plant): Looks like an eye ball and if you put it in your mouth, it will numb your gums and tongue.

### Dye sources

Hopi Red Dye Amaranth ( <i>Amaranthus cruentus</i> )	Red dye
Woad ( <i>Isatis Tinctoria</i> )	Blue dye
Bulls Blood Beet ( <i>Beta Vulgaris v cruenta</i> )	Deep red dye
Indigo ( <i>Indigofera Tinctoria</i> )	Blue dye
Black Holly hock ( <i>Althea rosea</i> )	Lavender/Mauve dye
Golden Marguerite ( <i>Anthemis Tinctoria</i> ) on the mordant used. Is also a nice cut flower	Yellow, Buff, or Orange dye depending
Safflower ( <i>Carthamus Tinctorius</i> )	Yellow or red dye from the flowers.
Weld ( <i>Reseda Luteola</i> )	Green dye.
Onions (white)	Brown dye.
Gallium	Pink dye.
Elderberries	Beautiful purple dye.

### Cut flowers to use fresh or dry for future projects

Gomphrenas make a nice dried flower.

Strawflowers (*Helichrysum*-tall mix) Colors from red to cream make a nice display in the garden - 3 feet tall. Heads dry on stems.

Sweet Annie (*Artemisia annua*) make a nice wreath and smells wonderful; Grows up to 3 feet.

Statice is easy to grow and dry. It comes in a wide variety of vivid colors.

Cocks comb comes in two sizes and is great for drying.

### Garden curiosity

Balsam, Touch me Not plant (*Impatiens balsamina*): Seed pods explode!

Woods sorrel: The seed pods explode!

Blue potatoes: The entire potato inside and out is blue. Stays blue color even when cooked.  
Sensitive plant (*Mimosa pudica*): When you touch it, it closes up its leave. You can blow on it and get the same effect. Good to use to show kids some plants do move!  
Luffa Gord (*Luffa cylindrica*): Is the source of luffa sponges!  
Bird house gourds: Grow in different shapes and sizes to make rattles or bird houses.

## Vines

Annelino Pole beans: The vines grow 6 feet or more and the beans are crescent shaped.  
Yard Long Beans: the vines grow 5 feet with beans at least a yard long!  
Scarlet Runner beans: Beautiful vines grow 6 feet or more and bear beautiful deep red flowers!  
Morning Glories: Come in several colors (Our favorite are the Heavenly Blue) they can grow to 12 feet or more. They open in the morning and close at night. Flying saucer morning glories bear flowers 6" across!  
Long vine cucumbers: **Amira**, its a spineless cucumber! **Boothby's Blonde** cucumber is yellow with black spines. It's a Maine heirloom cuke! **Diva** is a nice short day cuke that requires no pollination so is good for a greenhouse or indoor use, and is resistant to powdery mildew.

## Various Vegetables

Popcorns :Early Pink has a nice pink color for a change of pace.  
Broomcorn: Comes in several varieties. Choose the shortest day possible to grow it successfully in New Hampshire  
Sweet corn: The super sweet varieties keep there sugar levels in the refrigerator for several days.  
Multicolored corn: Also known as Indian corn comes in many shapes and sizes. Great for harvest projects and the birds love them too.  
Purple beans: Purple Trionfo Violetto is a bush type bean with purple pods. Royal Burgundy is another nice purple bean that turns deep green when cooked.  
Thumbelina carrots; Golf ball size carrots are great for little people!  
Graffiti; A neon purple cauliflower that keeps its color when cooked.  
Bright Lights; Swiss chard adds a nice rainbow to the garden and is delicious too!  
Gourds: Are a fun thing to grow and are many times more successful in a garden than pumpkins. They come in all shapes and sizes and lend themselves to many art projects from rattles to mini jack o lanterns.  
Leaf Lettuces: Go to seed quite readily and are a good way to show a plants life cycle. Replant the seeds and watch the cycle start again! Romaine varieties work very well for this.  
Peas: All types are a big hit in any child's garden. They come in bush varieties or longer vine types. None of the vines are usually more than 3 feet tall.  
Bell Peppers: come in a variety of shapes, sizes and colors. Try kaleidoscope mix to get most of the colors of the rainbow!  
Tomatoes 'Sun Gold' a cherry tomato is the best tasting.  
Pumpkins - 'Baby Bear' has a strong handle. 'Snack Jack' has edible seeds.

All of the above selections can be found in the Pinetree garden Seeds 2004 Seed Catalog. (See the Resource Page for further details).

### **Herbs for smelling and touching**

Lavender

Mints, especially chocolate and peppermint

Basil

Thyme

Rosemary

Parsley, grow Italian Flat Leaf

Lemon balm

Sage

Marshmallow (*Althea officinalis*)

***NEVER grow rue in a children's garden***

### **Edible Flowers**

***Make sure none have been sprayed.***

Nasturtiums

Signet marigolds *Tagetes tenuifolia*

Pot marigold (*Calendula officinalis*)

Violets, Johnny Jump Ups, violas, pansies

Chive flowers

Borage flowers

(See the Resource Page for seed catalog sources).

## Children's Garden Theme Ideas

Planting a garden around a theme reinforces learning and enhances interest in the garden for an extended period of time. It provides for many literature, craft, science, and food tie-ins. Following are some garden theme ideas. Use your and the kids imaginations to create many more!

### ABC Alphabet Garden

Plant a garden that includes plants whose name begins with each letter of the alphabet. If you don't have enough room for 26, choose letters representing the name of your group, school or a person.

Some plant ideas for letters:

- A - alyssum, aster
- B - balsam, basil, beans, broccoli
- C - cosmos, Celosia,
- D - daisy, dill
- E - eyeball plant, eggplant, evening primrose
- F - four o'clock, flax, fried egg plant
- G - geranium, gourds
- H - hollyhocks, hosta
- I - Impatiens, Indian blanket
- j - Jacob's ladder, Johnny-jump-up
- K - kale, kiss-me-over-the-garden gate
- L - love-lies-bleeding, lamb's ears, lemon balm, love-in-a-mist (nigella)
- M - marigold, milkweed, mint, money plant
- N - nasturtium
- O - obedient plant, ornamental pepper, oregano
- P - petunia, pansy, parsley, pinks
- Q - Queen Ann's lace, quaking grass
- R - rosemary, rose
- S - salvia, sage, snapdragons, sedum, strawflower, sunflower
- T- thyme, turtlehead, tomatoes, tansy
- U - unicorn plant
- V - verbena, violet
- W - wormwood
- X - xeranthemum
- Y - yarrow, yucca
- Z - zinnia

### Read About It:

- Alison's Zinnia*, Anita Lobel, Greenwillow Books, 1990
- Alphabet Garden*, Laura Jane Coats, Macmillian Pub., 1993.
- Alphabetical Soup*, Susy Spafford, Susy's Zoo, 1995.
- An Edible Alphabet*, Bonnie Christensen, Dial Books for Young Readers, 1994.



*Eating the Alphabet*, Lois Ehlert, Harcourt Brace Jovanovich,1989.  
*A Garden Alphabet*, Isabel Wilner, Dutton,1991.  
*A Gardener's Alphabet*, Mary Azarian, Houghton Mifflin,2000.

### **Animal or Zoo Garden (Plants with animal names)**

Spider flowers (Cleome)  
Lamb's ears  
Snapdragons  
Bee balm  
Hens and chicks  
Cardinal flower  
Tiger lily  
Catnip  
Cockscomb  
Foxglove  
Dandelions

#### **Read About It:**

*The Animal Garden*, Ogden Nash, M. Evans & Co., Inc.,1965.  
*Tiger Lilies and Other Beastly Plants*, Elizabeth Ring, Walker & Co.,1984.  
*The Zoo Garden*, Chris Hastings, Longstreet Press, Inc.,1997.

### **Pizza Garden**

Peppers  
Tomatoes  
Onions  
Wheat  
Basil 'lettuce leaf'  
Greek or Italian oregano  
Marigolds (representing the cheese) Signet varieties

#### **Read About It:**

*Grow Your Own Pizza*, Constance Hardesty, Fulcrum Kids, 2000.  
*The King of Pizza*, Sylvester Sanzari, Workman, 1995.  
*The Pizza Book: Fun Facts, a Recipe-the Works!*, 1992, Stephen Krensky, Scholastic. A great book with history and the recipe.  
*Roots Shoots Buckets and Boots*, Sharon Lovejoy, Workman,1999. (Pizza garden plans)  
*The Princess and the Pizza*, Mary Jane & Herm Auch, Holiday House, 2002.  
*Veggies on Our Pizza A to Z*, Chantelle B. Goodman, Pentland Press.2001 Teaches the alphabet and rhymes, all veggies on a pizza.

## **Salsa Garden**

Tomatoes

Peppers 'Salsa Delight'

Onions

Cilantro 'Slo Bolt'

### **Read About It:**

*Chicks and Salsa*, Aaron Reynolds, Bloomsbury Children's Books USA, 2005. (Includes recipes)

*Chile Fever: A Celebration of Peppers*, Elizabeth King, Dutton Children's Books, 1995.

*The Edible Mexican Garden*, Rosalind Creasy, Periplus, 2000.

*The Young Chef's Mexican Cookbook*, Karen ward, Crabtree, 2001.

## **Stone Soup Garden**

Potatoes

Carrots

Cabbage

Onions

Peas

Beets

Turnips

Squash

Beans

### **Read About It:**

*Bone Button Borscht*, Aubrey Davis, Kids CannPress, 1995 (Eastern European version)

*Pea Soup Fog*, Connie Macdonald Smit, Down East Books, 2004 (Includes a recipe for pea soup)

*Stone Soup*, Ann McGovern, Scholastic, 1968.

*Stone Soup*, Heather Forest, August House LittleFolk, 1998. (Includes a recipe.)

*Stone Soup*, Jon J. Muth, Scholastic Press, 2003. (An Asian tale)

*Stone Soup*, Marcia Brown, Aladdin, 1997.

## **Rainbow Garden**

Vegetables:

Swiss Chard 'Bright Lights'

Beans 'Royal Burgundy'

Tomato 'Big Rainbow'

Eggplant 'Neon'

Peppers - many color choices, chocolate, purple, yellow, orange, red

Potatoes 'All Blue'

Potatoes 'Yukon Gold' (for the pot of gold)

Broccoli 'Graffiti' purple  
Flowers: Planted in rings " ROY G BIV"  
Red - salvia  
Orange - marigolds  
Yellow - marigolds  
Green - parsley or bells of Ireland  
Blue - ageratum  
Indigo and violet - combine into purple - petunias, alyssum  
And for the pot of gold - marigolds 'Gold Nugget'

### **Read About It:**

*Blue Potatoes, Orange Tomatoes*, Rosalind Creasy, Sierra Club Book, 1994.  
*The Edible Rainbow Garden*, Rosalind Creasy, Periplus, 2000.  
*Growing Colors*, Bruce McMillan, Harper Trophy, 1998.  
*Planting a Rainbow*, Lois Ehlert, Harcourt Brace Jovanovich Pub., 1988.  
*The Rainbow and You*, E. C. Krupp, HarperCollins, 2000.

### **Dinosaur Garden**

Dinosaur gourds (maranka gourds)  
Dinosaur kale (lacinato kale)  
Ferns  
Horsetails (Equisetum)  
Ginkgo tree

### **Keyhole Garden**

Plant the garden in the shape of a keyhole. Kids can enter in the path and turn around in 'the hole' to exit, smelling the fragrant herbs along the way.

Mints: spearmint, peppermint  
Thyme  
Lemon balm  
Chamomile  
Lavender  
Sage

### **Tops and Bottoms Garden**

From the book *Tops and Bottoms*, Janet Stevens, Harcourt Brace & Co., 1995.  
Divide the garden space into thirds.  
On one third plant the 'bottom' crops: carrots, radishes and beets  
On the second third plant the 'top' crops: lettuce, broccoli and celery.  
On the last 'middle' third plant the sweet corn in a double row.

## **Spaghetti Garden**

Tomatoes  
Sweet peppers  
Onions  
Greek or Italian Oregano  
Carrots  
Basil  
Spaghetti squash

### **Read About It:**

*More Spaghetti I Say!*, Rita Golden Gelman, Scholastic, 1993.  
*Noodle Man: The Pasta Superhero*, April Pulley Sayre, Orchard Books, 2002.  
*On Top of Spaghetti*, Gene Barretta, Piggy Toes Press, 2004 (A pop-up)  
*Spaghetti Eddie*, Ryan Sanangelo, Boyds Mills Press, 2002.  
*The Spaghetti Party*, Doris Orgel, Bantam Books, 1995.

## **Peter Rabbit Garden**

Plants mentioned in the Peter Rabbit books by Beatrix Potter:  
Chamomile  
Radish 'French Breakfast' (the one Peter is holding in the story)  
Lavender  
Strawberry 'Pink Panda'  
Tansy  
Beet 'MacGregors Favorite'  
Lettuce  
Parsley  
Borage  
Mint  
Rhubarb

### **Read About It:**

*Beatrix Potter and Peter Rabbit*, Nichole Savy, Frederick Warne, 2002.  
*The Complete Tales of Beatrix Potter*, F. Warne & Co., 1989.  
*Peter Rabbit's Gardening Book*, Sarah Garland, Frederick Warne, 1983.  
*The Peter Rabbit and Friends Cookbook*, Naia Bray-Moffatt, Frederick Warne, 1994.

## **Fairy Garden**

Fairies, gnomes, elves and trolls have been a part of garden folklore and literature for centuries. Their presence adds an air of wonder and mystery to the garden. Plants historically connected with fairies and other natural spirits include:  
Primroses

Johnny-jump-ups  
Forget-me-nots  
Pansies and violets  
Dianthus - 'tiny rubies'  
Wild thyme  
Wood sorrel  
Periwinkle

Plant a garden for fairies in a circle incorporating some of the above plants. Make fairy houses from dried materials from the garden. Use your imagination...oak caps become fairy dishes, dried Nigella (love-in-a-mist) seed pods become teapots, Chinese lantern pods when immature and green become lantern lights, etc.

A fairy tea is fun and a way to celebrate May Day or Mid-Summer's Day (June 24) or a special birthday.

**Read About It:**

*Fairy Boat*, Tracy Kane, Great Gizmos Pub., 2002.

*Fairy Crafts*, Heidi Boyd, North Light Books, 2003.

*Fairy Fun*, Marla Schram Schwartz, Clarkson Potter, 1998.

*Fairy Houses*, Tracy Kane, Great White Dog Pub., 2001.

*Fairy Island*, Laura Martin and Cameron Martin, Black Dog & Leventhal Pub., 2005.

*The Fairy Party Book*, Marina T. Stern, Red Wheel, 2003.

*A Flower Fairies Treasury*, Cicely Mary Barker, Frederick Warne, 1997.

*Jethro Bird Fairy Child*, Bob Graham, Candlewick Press, 2002.



## Recipes

### Solar Tea

Using a clear glass jar or jug fill with 1 gallon of water. Crush several springs of freshly picked and washed mint leaves. Place in the jar. Set out in the sun in the morning. Keep in the sun. In the afternoon, pour into cups, add ice cubes. If you need to sweeten add a few drops of honey or sugar.

**Dirt Pudding;** Great to make when learning about soils and composting.

2 large boxes chocolate instant pudding

2 cups milk

2 cups frozen whipped cream

1 large package chocolate filled or wafer cookies, crushed

1 package gummy worms

Mix pudding and milk and add thawed  
the pudding mix.

Use a medium size clean flower pot put the pudding mixture. If using a pottery pot, first line with plastic wrap. Top with the remaining cookie crumb "dirt". Bury the gummie worms throughout the mix...just push them in.

### Veggie Dip

A quick simple dip can be made using sour cream (low fat is fine) and adding a tablespoon of fresh ground horseradish, mix in thoroughly.

### Salad Dressing

This is a simple vinaigrette for use with a green salad.

1 part cider or wine vinegar or lemon juice and one part olive oil, add salt and pepper to taste.

### Salsa

Make a simple salsa fresh from the garden using a hand-operated salsa maker (available from National Gardening Assoc.). No electricity is needed....make this right outside in the garden.

4-5 plum medium tomatoes or 2 medium round tomatoes

2 green onions

1 clove of garlic

1 jalapeno chili or 'Salsa Delight' pepper

Fresh cilantro

$\frac{1}{2}$  a large lime

$\frac{1}{2}$  teaspoon salt

Cut the pepper in half lengthwise and remove the seeds and white membrane. (An adult should do this, avoid touching your eyes, might want to wear gloves.) Place the pepper, onions and garlic in the salsa maker and crank. Add the tomatoes and cilantro. Crank until the desired consistency. Squeeze the lime juice over all and salt to taste. Serve with tortilla chips.

### **Refrigerator Pickles**

Slice cucumbers (about 7 medium) and 2 medium onions...enough to fill a 2 quart container.

Bring to a boil:

2 tablespoons salt

1 cup vinegar

2 cups sugar

1 tablespoons celery seed

Pour hot brine over the cucumbers and onions. Keep in the refrigerator. These will keep for weeks. You may also put in smaller containers and freeze.

### **Fruit Dip**

1 3 oz jar marshmallow cream

2 8 oz packages cream cheese

Mix together until smooth. Serve with fresh fruit, apples, strawberries, melons, grapes, bananas, peaches, etc.

### **Read About It:**

*Better Than Peanut Butter & Jelly*, Wendy Muldawer & Marty Mattare, McBooks Press, 1998.

*Blue Moon Soup: A Family Cookbook*, Gary Goss, Little, Brown & Co., 1999.

*The Children's Kitchen Garden*, Georgeanne & Ethel Brennan, Ten Speed Press, 1997.

*Fanny at the Chez Panisse*, Alice Waters, HarperCollins, 1992.

*Honest Pretzels*, Mollie Katzen, Tricycle Press, 1999.

*The Kids' Multicultural Cookbook*, Deanna Cook, Williamson Pub. Co., 1995.

*Let's Eat! :What Children Eat Around the World*, Beatrice Hollyer, Henry Holt & Co., 2004.

*Once Upon a Recipe*, Karen Greene, New Hope Press, 1987.

*Pretend Soup*, Mollie Katzen, Tricycle Press, 1994. Cooking with and for Pre-schoolers.

*Salad People and More Recipes: A New Cookbook for Preschoolers & Up*, Mollie Katzen, Tricycle Press, 2005

## YOU MAKE IT

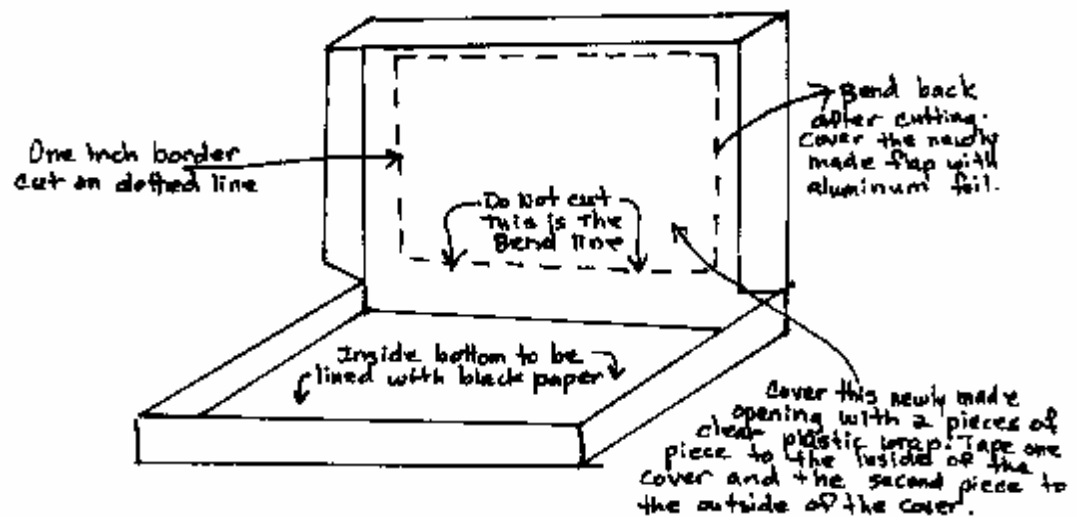
### Pizza Box Solar Oven

Chocolate s'mores and small pizzas are fun to cook outside using the heat from the sun. A pizza box solar oven can reach temperatures of 275 degrees. This is hot enough to cook s'mores and pizza. Allow time to preheat the oven and about an hour for cooking.

You'll Need:

- A pizza box
- Black construction paper
- Aluminum foil
- Clear plastic wrap (Saran wrap)
- Scissors, tape, pencil

To Make:



1. Open the pizza box
2. Draw a line, one inch from the inside edge of the box top. All the way around (see diagram.)
3. Cut along 3 sides, leaving the line along the bottom of the box top uncut. (this will form a flap.)
4. Fold the flap out forming a crease along the uncut edge.
5. Wrap the inside) face of the flap with aluminum
6. Place them in the box. (S'mores = a graham cracker sandwich. One graham cracker for the top, another on the bottom. In between them put two sections of a Hershey's chocolate bar and a marshmallow.)
7. Go garden for a while and wait for the Yum!!!! When ready, remove from oven and top with the other graham cracker half. Enjoy!!!

For pizza, use English muffins, or pita bread. Spread pizza sauce on top and bake in the oven for an hour or until warm enough to eat.

## **Read About it:**

*Amazing Sun Fun Activities*, Michael Daley, McGraw-Hill, 1997.

*Sun Bread*, Elisa Kleven, Dutton Children's Books, 2001.

[www.sunoven.com](http://www.sunoven.com)

## **I Spy Binoculars and Scopes**

These binoculars and scopes lack glass and any magnification; however, they act as an instrument to allow a young child's wandering eyes to focus intently on an object. These are great to use for bug hunts and close inspection of flower parts.

### **To Make Binoculars:**

Materials needed -

1. 2 cardboard tubes (can be empty toilet paper rolls) 4  $\frac{1}{2}$  inches long
2. 24 inch long piece of string
3. Duct tape

With the tubes side by side, tape them together. Put a small hole in one end of each tube to attach the string. Tie each end of the 24" piece of string through the two holes in the tubes. Voila! You have binoculars. Place them around your neck and enjoy.

### **To Make Scopes:**

Use PVC pipe, 1  $\frac{1}{2}$  inches in diameter. These will last longer than cardboard tubes and hold up when wet. (Note: The length of PVC will depend on how many children you need scopes for. Every child will get a 4  $\frac{1}{2}$  inch piece of the PVC so buy length accordingly.) Bring the scopes out to the garden for an "I spy" hunt. (Using tubes to look at things helps a small child focus.)

## Bug Suckers

Known to entomologist as aspirators, they are used to capture small insects for close inspection.

They are:

- A good way to recycle clear soda or water bottles.
- A good way to observe small insects; without having to touch them.
- Inexpensive, only 23 cents!

### Materials needed:

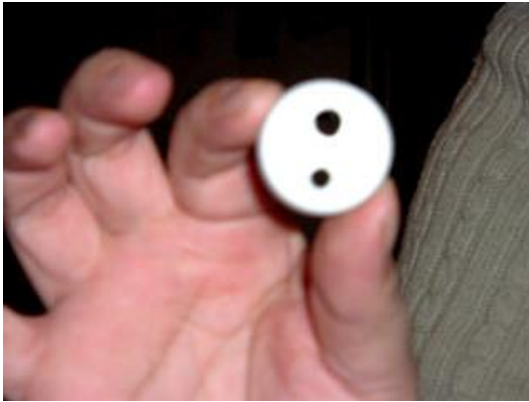
- Clear plastic bottles with caps (12 oz. size is best, small bottles of water can be bought at your local grocery store).
- Drill and drill bits (the size of the drill bits will depend on the size of the bendable straws you use).
- Bendable straws (the bigger the straw diameter the bigger the bug you can suck into the bottle. Can be found at the grocery store).
- Scissors
- $\frac{1}{4}$  inch clear plastic tubing (can be found at Home Depot in the plumbing dept.)  
NOTE: do not go to the lawn and garden dept. They have it but it is twice to three times more expensive as the plumbing dept.
- Duct tape
- Hot glue gun
- Old panty hose (one legs worth will make more bug suckers than you can use).

### Let's proceed:

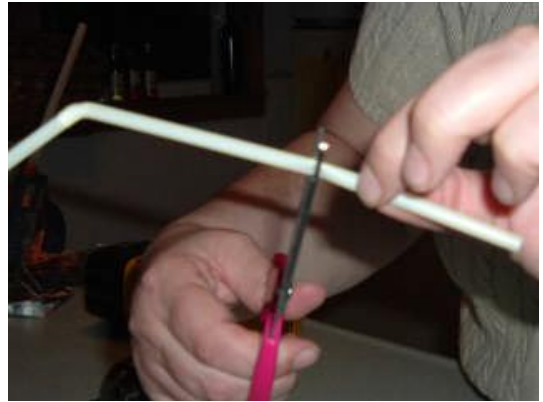
- Drill two holes in the cap. One hole will be for the clear plastic hose and the other will be for the bendable straw. Choose the drill bits to use with that in mind.
- Cut a piece of tubing that is approximately the same length as the arm of the person that is going to use the aspirator. (For a 5 year old, I cut a piece 15 to 18 inches long).
- Cut the long end of a bendable straw so it extends into the bottle  $\frac{3}{4}$  of the way.
- (When inserted the bend will be flush with the cap and the bottom of the straw should not touch the inside bottom of the bottle).
- Secure a one inch piece of panty hose over the end of the clear plastic tubing using the duct tape. (This will stop you from aspirating a bug into your mouth when you are sucking them into the bottle).
- From the underside of the cap, insert the hose through its hole and pull it through until the secured panty hose screen touches the cap.
- Secure the bendable straw and the hose with hot glue inside the cap.
- Screw cap back on the bottle.
- Have fun sucking up the bugs!



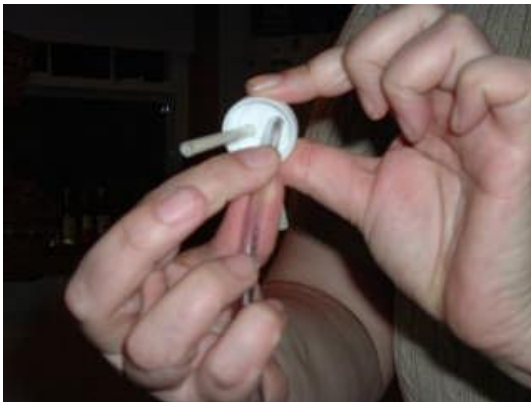
Drill



Cut



Insert



Attach screen



Secure



Have Fun



## Peas on Earth

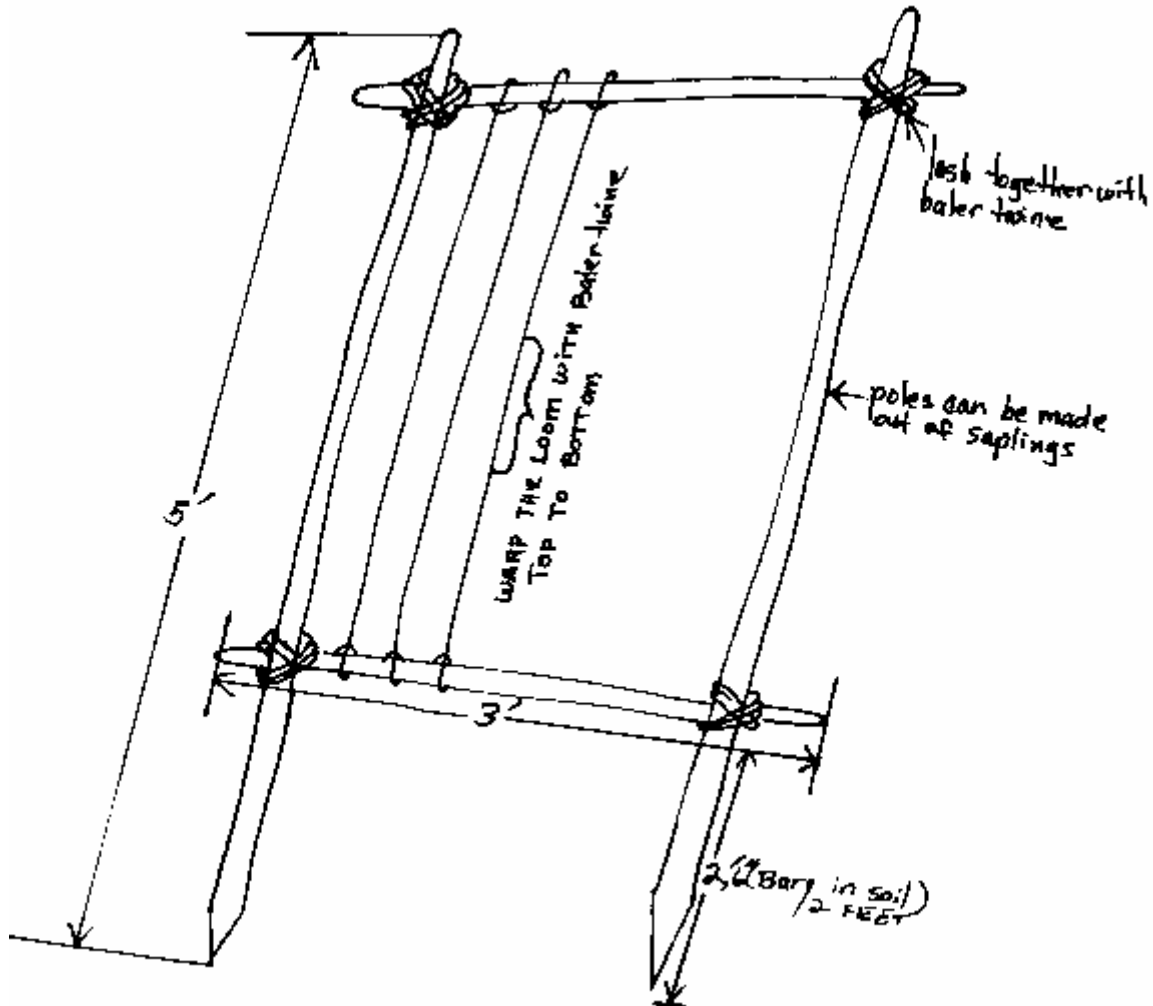
Find a good picture of the earth (Google image search has good ones), print one for each child on regular printing paper. Glue paper to cardboard and let the children fill in the continents with dried peas. For diversity, use different size seeds in different places all over the picture, for example; use mustard seeds for the oceans. Talk about the earth and show them where they live!



## Weaving Frame

Make a weaving frame using pieces of 2 x 4, or gather tree limbs from the woods. You will need 2 pieces 5 feet long and 2 pieces 3 feet long.

Follow the diagram and nail or tie the pieces together. Dig two holes 2 feet deep and stick the ends in. After the frame is upright tamp the earth in to hold it up. Warp up the frame with baler twine or string.



## Corn Husk Dolls

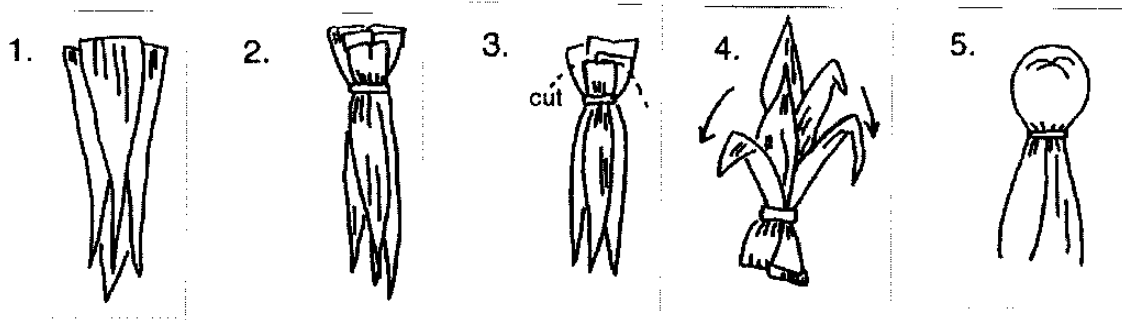
Take four cornhusks and arrange them as shown in. Fig. 1

Using a small piece of string, tie the straight ends together tightly. Fig 2

Trim and round the edges with scissors. Fig. 3

Turn upside down and pull long ends of husks down over the trimmed edges.

Fig 4 Tie with string to form the head. Fig 5



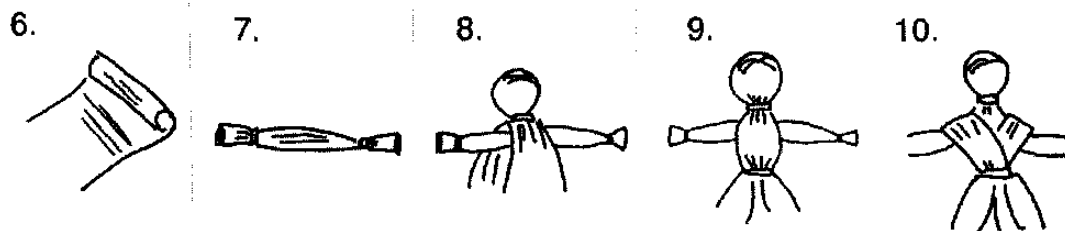
Take another husk, flatten it, and roll into a tight cylinder. Fig 6

Tie each end with string. This forms the doll's arms. Fig 7

Fit the arms inside of the long husks, just below the "neck". Fig 8

Tie with string, as shown, to form a waist. Fig 9

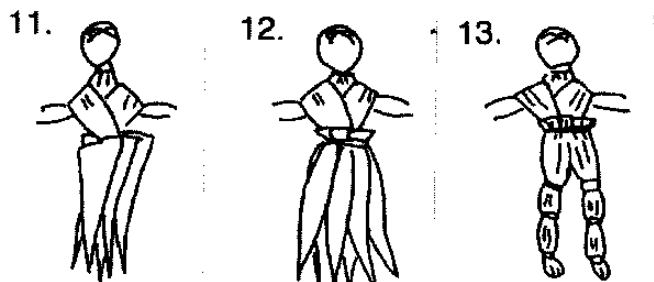
Drape a husk around the arms and upper body in a criss-cross pattern. Fig 10



Take four or five husks, straight edges together, and arrange around waist.

Fig 11 Decide if you want a male or female doll.

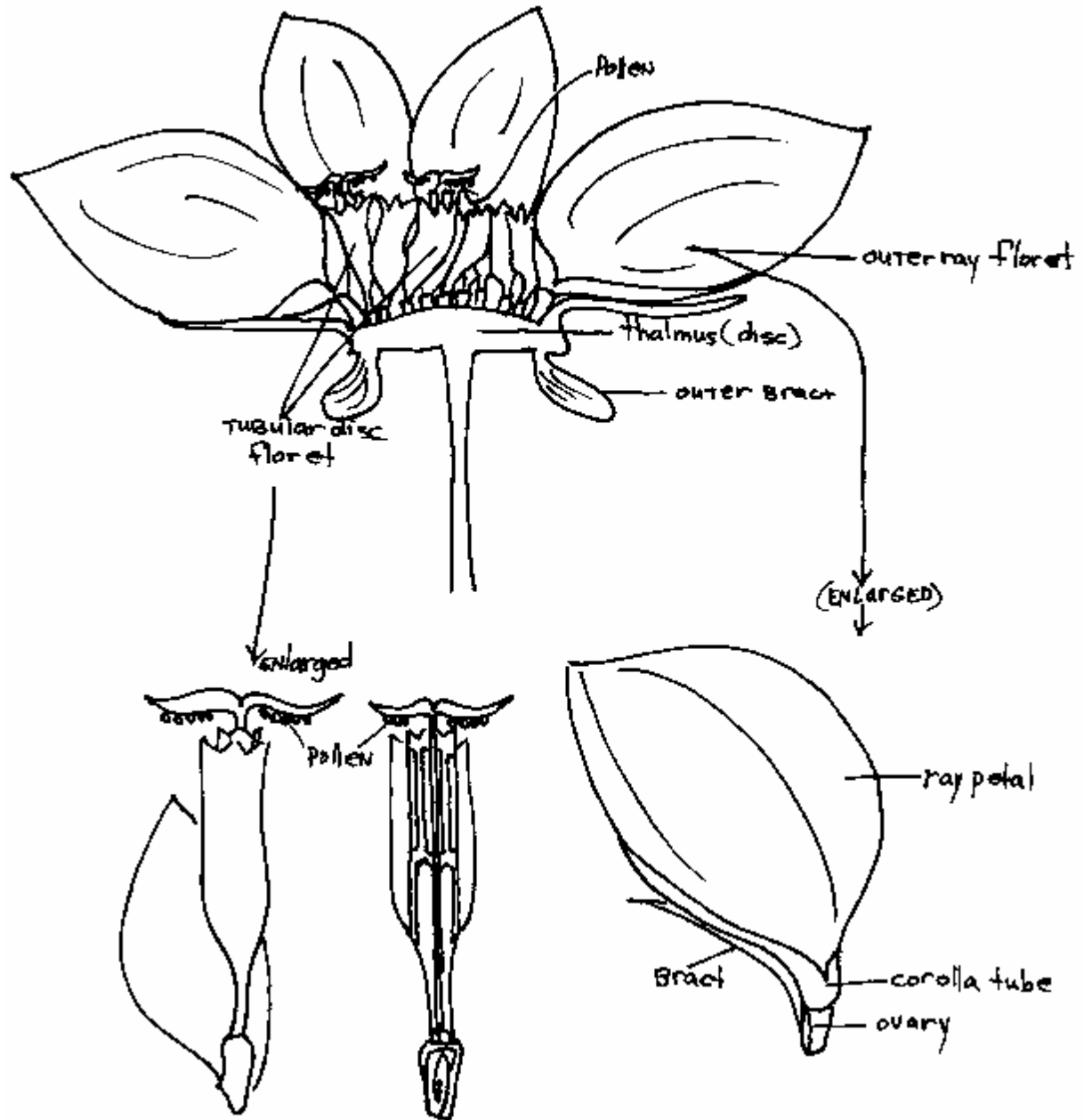
Female: Tie with string Fig 12 Male: Follow Fig 13 to form legs. Tie legs with small strips of husks or string. Decorate with yarn or dried corn silk.



## Diagrams

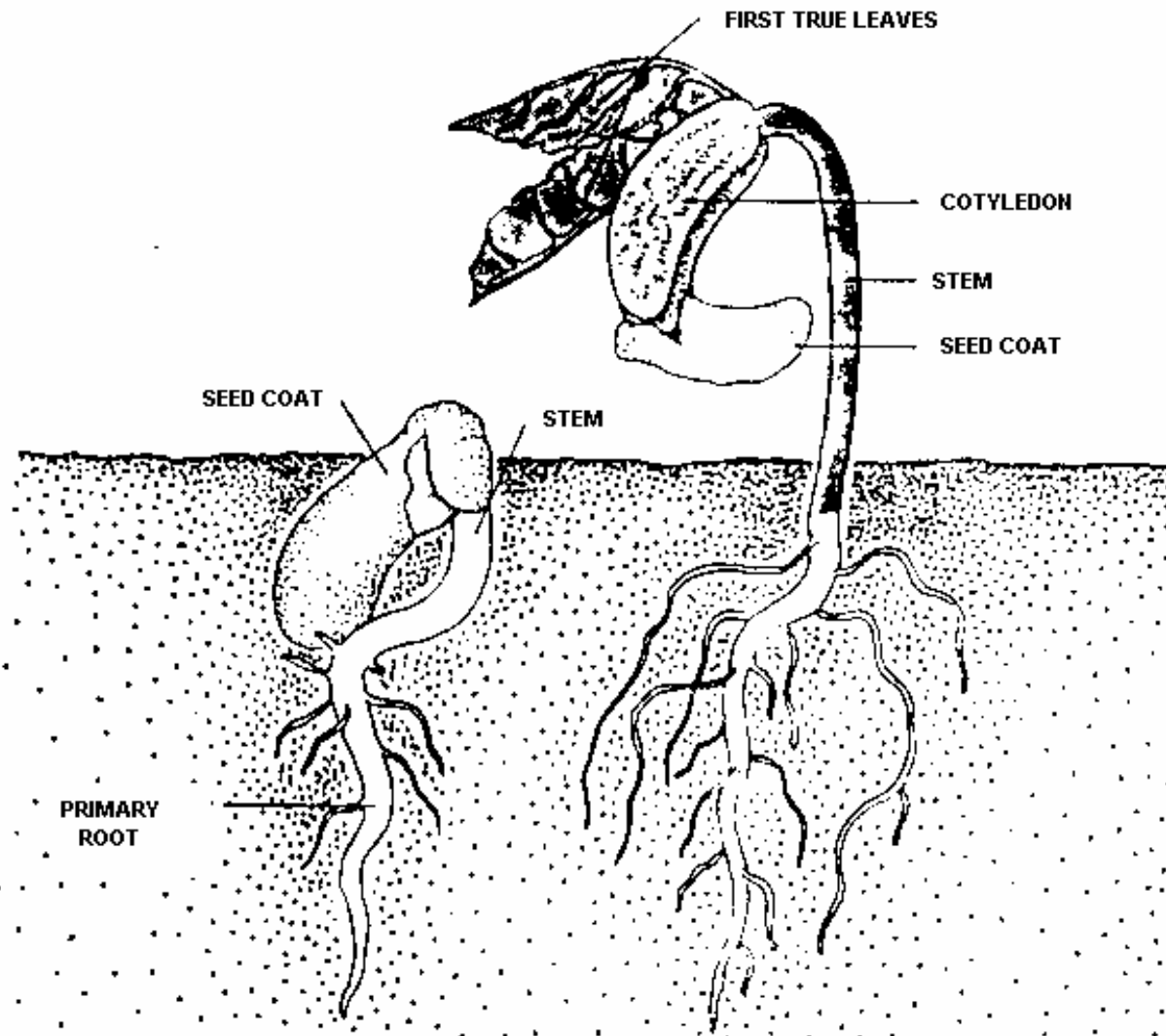
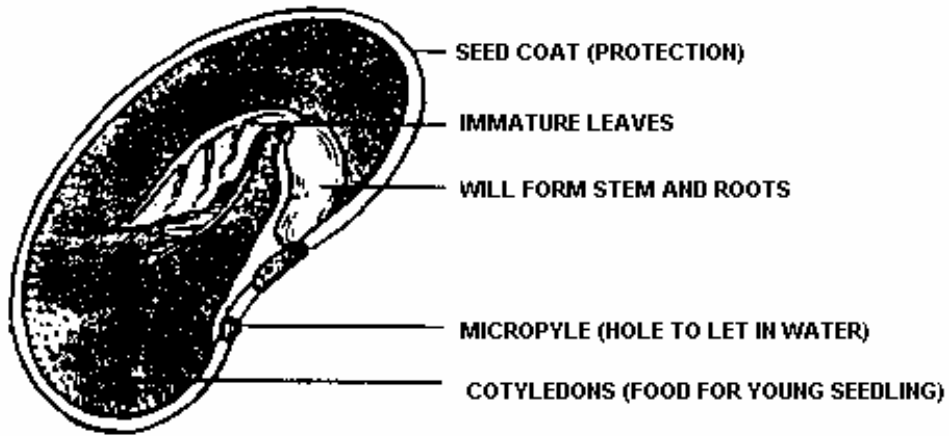
### Diagram of a Disc Floret

Similar parts would be found in all flowers of the Asteracea family like: Sunflowers, Dahlias, and Dandelions.





A.



## Poisonous Plants

All children of any age should be taught not to put any plant parts in their mouths until an adult tells them OK. Many plants grown in gardens for and by children may have many beautiful and useful parts, but also some parts of the same plant may be toxic. Just because the potato tuber is edible does not mean the leaves are safe to eat. Some plants we do not eat but may cause skin reactions, like poison ivy, sumac, nettles and rue. Some plants may have beautiful berries that attract children and are not safe, like holly and yew. Some fruits that we eat cooked are not good to eat raw, lima beans, kidney beans, etc. Listed here are a few of the common plants found in gardens. Check the references below for more and have the number of your local Poison Control Center handy. Keep a piece of the suspected plant for identification.

Some plants to be aware of:

Common name:	Scientific name	Dangers
Castor bean seeds	<i>Ricinus communis</i>	leaves and
Lantana	<i>Lantana camara</i>	all parts
Lily of the Valley flowers	<i>Convallaria majalis</i>	leaves and
Nettle, stinging	<i>Urtica spp.</i>	all parts
Poison ivy leaves	<i>Toxicodendron radicans</i>	plant sap,
Poison sumac leaves	<i>Toxicodendron vernix</i>	plant sap,
Sweet peas	<i>Lathyrus odoratus</i>	peas
Rue leaves	<i>Ruta graveolens</i>	plant sap on causes a rash
Yew	<i>Taxus spp.</i>	all parts

Apricots, apples, peaches, cherries and plums: seeds contain cyanide

Acorns: contain harmful poisons

Holly berries: berries harmful

Tomatoes, eggplant: leaves poisonous

Raw kidney, pole, runner beans and lentils: contain small amounts of poisons that break down when cooked.

Raw lima beans: eat only cooked

Rhubarb: leaves poisonous

Potato: the green parts and sprouts should not be eaten.

### **Read About it:**

*Baby-Safe Houseplants*, John & Delores Alber, Genus Books, 1987.

*Common Poisonous Plants and Mushrooms of North America*, Nancy J. Turner and Adam F. Szczawinski, Timber Press, 1991.

*Creating a Low-Allergen Garden*, Lucy Huntington, Laurel Glen Pub., 1998.

*Plant Alert: A Garden Guide for Parents*, 2001, Catherine Collins, Sterling Pub., 2001.

*Plants for Play: A Plant Selection Guide for Children's Outdoor Environments*, Robin C. Moore, MIG Communications, 1993. Includes a section on toxic plants.

## **SEED & PLANT & SUPPLY SOURCES**

Bluestone Perennials, Inc.  
7211 Middle Ridge Road  
Madison, OH 44057  
[www.bluestoneperennials.com](http://www.bluestoneperennials.com)

W. Atlee Burpee & Co.  
Warminster, PA 18974  
[www.burpee.com](http://www.burpee.com)

The Cooks' Garden  
P. O. Box C5030  
Warminster, PA 18974  
[www.cooksgarden.com](http://www.cooksgarden.com)

Fedco Seeds  
P. O. Box 520  
Waterville, ME 04903  
[www.fedcoseeds.com](http://www.fedcoseeds.com)

Gurney's Seed & Nursery  
PO Box 4178  
Greendale, IN 47025  
[www.gurneys.com](http://www.gurneys.com)

Harris Seeds  
355 Paul Rd.  
PO Box 24966  
Rochester, NY 14624  
[www.harriseseeds.com](http://www.harriseseeds.com)

Johnny's Selected Seeds  
Winslow, ME 04901  
[www.johnnyseeds.com](http://www.johnnyseeds.com)

John Scheepers Kitchen Garden Seeds  
23 Tulip Drive  
PO Box 638  
Bantam, CT 06750  
[www.kitchengardenseeds.com](http://www.kitchengardenseeds.com)

Geo. Park Seed Co.  
Greenwood, SC 29647  
[www.parkseed.com](http://www.parkseed.com)

Pinetree Garden Seeds  
Box 300  
New Gloucester, ME 04260  
[www.superseeds.com](http://www.superseeds.com)

Seeds of Change  
P.O. Box 15700  
Santa Fe, NM 87506  
[www.seedsofchange.com](http://www.seedsofchange.com)

Seed Savers Exchange  
3076 North Winn Road  
Decorah, IA 52101  
[www.seedsavers.org](http://www.seedsavers.org)

Select Seeds Antique Flowers  
180 Stickney Hill Road  
Union, CT 06076  
[www.selectseeds.com](http://www.selectseeds.com)

R.H. Shumway, Seedsman  
P. O. Box 1  
Granitville, SC 29829  
[www.rhshumway.com](http://www.rhshumway.com)

Stokes Seeds Inc.  
Box 548  
Buffalo, NY 14240  
[www.stokeseeds.com](http://www.stokeseeds.com)

Vermont Bean Seed Co.  
334 W. Stroud St.  
Randolph, WI 53956  
[www.vermontbean.com](http://www.vermontbean.com)

Well-Sweep Herb Farm  
205 Mt. Bethel Road  
Port Murray, NJ 07865  
[www.wellsweep.com](http://www.wellsweep.com)

## **SUPPLIES**

Acorn Naturalists  
155 El Camino Real  
Tustin, CA 92780  
1-800-422-8886  
[www.acorunnaturalists.com](http://www.acorunnaturalists.com)

A. M. Leonard  
241 Fox Drive  
PO Box 816  
Piqua, OH 45456  
1-800-543-8955  
[www.amlgardener.com](http://www.amlgardener.com)

Charley's Greenhouse Supply  
17979 State Route 536  
Mount Vernon, WA 98273  
1-800-322-4747  
[www.charleysgreenhouse.com](http://www.charleysgreenhouse.com)

Gardener's Supply Co.  
128 Intervale Road  
Burlington, VT 05401  
1-800-660-3500  
[www.gardeners.com](http://www.gardeners.com)

Insect Lore  
P.O. Box 1535  
Shafter., CA 93263  
1-800-LIVE BUG  
[www.insectlore.com](http://www.insectlore.com)

National Gardening Association  
1100 Dorset Street  
South Burlington, VT 05403  
[www.garden.org](http://www.garden.org)



## Reference Books for Gardening with Children

- 10 Terrific Vegetables*, National Gardening Assoc., 2002.
- Backyards & Butterflies: Ways to Include Children With Disabilities in Outdoor Activities*,  
Doreen Greenstein et al, Brookline Books, 1995.
- Better Homes & Gardens New Junior Garden Book*, Felder Rushing, Meredith Books, 1999.
- A Child's Garden*, Molly Dannenmaier, Simon & Schuster, 1997.
- Creative Vegetable Gardening*, 2004, Joy Larkcom, Abbeville Press, 2004.
- Digging Deeper: Integrating Youth Gardens Into Schools & Communities*, Joseph Kiefer &  
Martin Kemple, American Community Gardening Assoc., 1998.
- Dinner from Dirt*, Emily Scott & Catherine Duffy, Gibbs-Smith, 1998.
- Dig, Plant, Grow*, Felder Rushing, Cool Springs Press, 2004.
- Eddie's Garden and How to Make Things Grow*, 2004, Sarah Garland, Frances Lincoln, Ltd.
- The Family Garden: Clever Things to Do In, Around and Under the Garden*, Jan and Michael  
Gertley, Sterling Pub., 1997.
- Four Season Harvest*, Eliot Coleman, Chelsea Green Pub., 1999.
- Fun With Gardening: 50 Great Projects Kids Can Plant Themselves*, Clare Bradley,  
Hermes  
House, 2000.
- Garden Crafts for Kids: 50 Great Reasons to Get Your Hands Dirty*, Diane Rhoades,  
Sterling Pub., Co., 1995.
- Garden Fun!*, Vicky Congdon, Williamson Pub., 2002.
- The Gardening Book*, Jane Bull, Dorling Kindersley Ltd., 2003.
- Gardening With Children*, Beth Richardson, Taunton Books, 1998.
- Gardening With Children*, Kim Wilde, C. Collins Pub, 2005.
- Gardening Wizardry for Kids*, L. Patricia Kite, Barrons. 1995.
- Great Gardens for Kids*, Clare Matthews, Hamlyn, 2002.
- The Great Outdoors: Restoring Children's Right to Play Outside*, Mary S. Rivkin, Nat'l.  
Assoc. for the Education of Young Children, 1995.
- Greening School Grounds*, Tim Grant, New Society Pub., 2001.
- Grow Lab: Activities for Growing Minds*, 1990, Eve Pranis & Joy Cohen, Natl. Gardening  
Assoc., 1990.
- Growth Through Nature: A Preschool Program for Children With Disabilities*, Stephanie  
Molen et al., Sagapress, 1999.
- Grow Your Own Pizza*, Constance Hardesty, Fulcrum Publishing, 2000.
- Hollyhock Days*, Sharon Lovejoy, Interweave Press, 1991.
- Hollyhocks and Honeybees: Garden Projects for Young Children*, Sara Starbuck, Marla  
Olthof and Karen Midden, Redleaf Press., 2002.
- How Does Your Garden Grow?: Great Gardening for Green-Fingered Kids*, Clare  
Matthews,  
Hamlyn, 2005.

*How Groundhog's Garden Grew*, 2003, Lynne Cherry, Blue Sky Press.

*Junior Master Gardener Handbook and Teacher/Leader Guide, and Health & Nutrition from the Garden*, Texas A&M Extn. Service, Texas A&M University, 1999.

*The Growing Classroom*, Roberta Jaffe & Gary Appel, Addison Wesley, 1990.

*The Kids Can Press Jumbo Book of Gardening*, 2000, Karyn Morris, Kids Can Press, 2000.

*Kids' Container Gardening*, Cindy Krezel, Ball Pub., 2005.

*Kids Cook Farm-Fresh Food*, 2002, California Department of Education.  
([www.cde.ca.gov/cdepress](http://www.cde.ca.gov/cdepress))

*Kids Gardens*, Kevin Raftery, Klutz, Inc., 1989.

*Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*, Richard Louv,  
Algonquin Books, 2005.

*Learn and Play in the Garden*, Meg Herd, Barron's, 1997.

*Living Willow Sculpture*, Jon Warnes, Search Press, 2000.

*Making Paths & Walkways*, Paige G. Blomgren, Lark Books, 1999.

*The Organic Salad Garden*, Joy Larkcom, Frances Lincoln, 2001.

*Plants for Play*, Robin C. Moore, MIG Communications, 1993.

*Ready, Set, Grow!: A Guide to Gardening With Children*, Suzanne Frutig Bales, Macmillan, 1996.

*Roots, Shoots, Buckets & Boots*, Sharon Lovejoy, Workman Pub., 1999.

*Schoolyard Mosaics: Designing Gardens and Habitats*, National Gardening Association., 2003.

*Sowing the Seeds of Success*, Marcia Eames-Sheavly & National Gardening Assoc., 1999.

*Square Foot Gardening*, Mel Bartholomew, Rodale, 2005.

*Sunflower Houses*, Sharon Lovejoy, Workman Pub., 1994.

*Steps to a Bountiful Kids' Garden*, National Gardening Assoc., 2001.

*Unearthing Garden Mysteries: Experiments for Kids*, Ellen Talmage, Fulcrum Kids., 2000.

*Victory Garden Kids' Book*, Marjorie Waters, Globe Pequot., 1994.

## Children's Reading Books:

This List of books are the ones we enjoyed relating to gardening, and are recommended by the teachers at the Child Study and Development Center:

*Franklin Plants a Tree*, by Paulette Bourgeois and Brenda Clark.  
Scholastic Books, Inc. New York. 2001.

*The Sunflower House*, by Eve Bunting.  
Voyager Picture Books. 1999.

*Flower Garden*, by Eve Bunting.

Voyager Picture Books. 2000.

*Mouse and Mole and the Year-Round Garden*, by Doug Cushman.  
Scholastic Books, Inc. New York. 1994.

*A Tree is Growing*, by Arthur Dorros.  
Scholastic Books, Inc. New York. 1997.

*Eating the Alphabet: fruits and vegetables from A to Z*, by Lois Ehlert.  
School and Library Binding. 1989.

*Red Leaf, Yellow Leaf*, by Lois Ehlert.  
Scholastic Books, Inc. New York. 1991.

*Round the Garden*, by Omri Glaser.  
Scholastic Books, Inc. New York. 2000.

*The Apple Pie Tree*, by Zoe Hall.  
Scholastic Books, Inc. New York. 1996.

*The Reason for a Flower*, by Ruth Heller.  
Scholastic Books, Inc. New York. 1999.

*Frogs and Toads*, by Bobbie Kalman and Tammy Everts.  
Crabtree Publishing Co. 1994.

*The Best Book of Bugs*, by Claire Llewellyn.  
Kingfisher Publications, New York. 1998.

*The Rose in my Garden*, by Arnold Lobel.  
Scholastic Books, Inc. New York. 1984.

*Have you seen Trees?* by Joanne Oppenheim.  
School and Library Binding. 1995.

*From Tadpole to Frog*, by Wendy Pfeffer and Holly Keller.  
Harper Collins Pub. 1994.

*Dandelions*, by Mia Posada.  
Scholastic Books, Inc. New York. 2000.

*Backyard Insects*, by Millicent Selsam.  
Scholastic Books, Inc. New York. 1999.

*Tops and Bottoms*, by Janet Stevens.  
Scholastic Books, Inc. New York. 1995.

Pumpkin Pumpkin, by Jeanne Titherington.  
Greenwillow Books, New York. 1986.

### Reference Books for Teachers:

*A Child's Garden: Enchanting Outdoor Spaces for Children and Parents*, by Molly Dannenmaier.  
Simon and Schuster, Inc. 1998.

*Roots, Shoots, Buckets, and Boots*, by Sharon Lovejoy.  
Workman Publishing, New York. 1999.

*Kids Gardening: A Kid's Guide to Messing Around in the Dirt*, by Kevin Raftery, Kim Gilbert Raftery and Jim McGuinness.  
Klutz Press, Palo Alto, CA. 1989.

*Garden Crafts for Kids: 50 Great Reasons to Get Your Hands Dirty*, by Diane Rhodes.  
Sterling Publishing Co., Inc., New York.

*Butterfly Gardens*, by Brooklyn Botanic Garden, Inc. 1995.

## Available Resources for Teachers about gardening

### University of New Hampshire, Cooperative Extension by Individual County:

#### **Belknap County**

36 County Drive, Laconia NH, 03246-2900

(603) 527-5475

#### **Carroll County**

75 Main st., P.O. Box 860, Center Ossipee, NH, 03814

(603) 539-3331

#### **Cheshire County**

800 Park Ave., Keene, NH, 03431-1513

(603) 352-4550

#### **Coos County**

629A Main St., Lancaster, NH, 03584-9612

(603) 788-4961

#### **Grafton County**

3785 Dartmouth College Highway, Box 8 North Haverhill, NH, 03774-4936 (603) 787-6944

#### **Hillsborough County**

329 Mast road, Goffstown, NH, 03045

(603) 641-6060

#### **Merrimack County**

315 Daniel Webster Highway, Boscaawen, NH, 03303

(603) 225-5505

#### **Rockingham County**

113 North road, Brentwood, NH, 03833

(603) 679-5616

#### **Strafford County**

259 County Farm Road, Unit 5 Dover, NH, 03820-6015

(603) 749-4445

#### **Sullivan County**

24 Main St., Newport, NH, 03773

(603) 863-9200

#### **UNH Family Home and Garden Center**

1-877-398-4769

ceinfo@unh.edu

#### **Gardening Resources**

www.gardening.cornell.edu

#### **National Gardening Association's, Youth Garden Grants**

[www.kidsgardening.com/grants](http://www.kidsgardening.com/grants)

#### **The American Horticultural Society**

www.ahs.org

#### **Pinetree Garden Seeds,**

www.superseeds.com

#### **Johnny's Selected Seeds**

www.johnnyseeds.com

#### **Burpee Seeds**

www.burpee.com

#### **Park Seeds**

[www.parkseed.com](http://www.parkseed.com)

#### **Seeds of Chang,**

[www.seedsofchange.com](http://www.seedsofchange.com)

#### **Seed savers Exchange,**

www.seedsavers.org