Kindergarten Garden Lessons
(From the Center for Ecoliteracy Curriculum Binder)

1. Sunflower House, Pumpkins and Sunflowers (c. Growing Great: Inspiring Healthy Eating)

2. Have a Worm Party! & Worm Facts: Food, Home, Help (by Maria Sayles, c. The Lesson Pathway Project developed by Education Outside)

3. Tops and Bottoms Salad Garden (c. Growing Great: Inspiring Healthy Eating)

4. Treasure Hunt and Share (by Rusty McCall, c. The Lesson Pathway Project developed by Education Outside)

5. Alphabet Hike (c. The Lesson Pathway Project developed by Education Outside)

6. Counting Garden Hunt (c. The Lesson Pathway Project developed by Education Outside)

7. Food from Trees (by Kelly Nichols, c. The Lesson Pathway Project developed by Education Outside)

8. Bug Hunt! Who Lives Here? (by Maria Sayles, The Lesson Pathway Project developed by Education Outside)

9. Kindergarten Learning Garden Lessons (c. Captain Planet's Learning Gardens)

Pre-K/Kindergarten/First Grade Spring Lesson

Pre-K/K — Sunflower House
1st — Pumpkins and Sunflowers

Objective:

1) Students will bring literature to life by planting a garden similar to one in a story they read in class.
2) Students will learn that plants need sunlight and water to grow, and the basic structures of a plant.
3) Students will learn that different plants have different features and grow in different ways.

California State Content Standards:

1) Kindergarten

A) English/Language Arts

2.0 Reading Comprehension
Comprehension and Analysis of Grade-Level-Appropriate Text

2.2 Use pictures and context to make predictions about story content.
2.3 Connect to life experiences the information and events in texts.
2.4 Retell familiar stories.
2.5 Ask and answer questions about essential elements of a text.

3.0 Literary Response and Analysis
Narrative Analysis of Grade-Level-Appropriate Text

3.1 Distinguish fantasy from realistic text.

B) Math -- Measurement and Geometry

1.0 Students understand the concept of time and units to measure it; they understand that objects have properties, such as length, weight, and capacity, and that comparisons may be made by referring to those properties.

1.1 Compare the length, weight and capacity of objects by making direct comparisons with reference objects (e.g. note which object is shorter, longer, taller, lighter, heavier, or holds more).

C) Science—Life Science

2. Different types of plants and animals inhabit the earth. As a basis for understanding this concept:

a. Students know how to observe and describe similarities and differences in the appearance and behavior of plants and animals (e.g., seed-bearing plants, birds, fish, insects).
b. Students know stories sometimes give plants and animals attributes they do not really have.
c. Students know how to identify major structures of common plants and animals (e.g., stems, leaves, roots, arms, wings, legs).

2) First Grade

A) English/Language Arts

2.0 Reading Comprehension

Comprehension and Analysis of Grade-Level-Appropriate Text

2.2 Respond to who, what, when, where, and how questions.

2.3 Follow one-step written instructions.

2.4 Use context to resolve ambiguities about word and sentence meanings.

2.5 Confirm predictions about what will happen next in a text by identifying key words (i.e., signpost words).

2.6 Relate prior knowledge to textual information.

B) Math

MEASUREMENT AND GEOMETRY

1.0 Students use direct comparison and nonstandard units to describe the measurements of objects.

1.1 Compare the length, weight, and volume of two or more objects by using direct comparison or a nonstandard unit.

C) Science—Life Science

2. Plants and animals meet their needs in different ways. As a basis for understanding this concept:

a. Students know different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places.

b. Students know both plants and animals need water, animals need food, and plants need light.

c. Students know animals eat plants or other animals for food and may also use plants or even other animals for shelter and nesting.

e. Students know roots are associated with the intake of water and soil nutrients and green leaves are associated with making food from sunlight.

Lesson Outline:

A. Lesson

a. Read/Review the Story

b. Introduce Sunflower and Pumpkin seeds—compare to seeds that we buy for food

c. Discuss growing habits of Sunflowers and Pumpkins

B. Garden Rules

C. Planting Plans

D. Plant

Seeds/Supplies:

Pumpkin—Jack O' Lantern, Jack-Be-Nimble (miniature), Lumina (white)

Sunflowers—Mammoth (8-10 feet), Autumn Beauty (5-7 feet), Sunspot (dwarf 2-4 feet)

Lesson:

This lesson is based on literature. *If possible, have the teacher read the story to the class before you come to plant.* Then you just review the story with the students. Reading the story and doing the planting will take longer than 30 minutes. If you read Sunflower House, you may want to plant your seeds in a design that would let children go inside a "house" as the plants grow tall.

**Also, please note: These plants grow big (sunflowers tall, pumpkins long vines along ground) so we plant very few seeds. Each child will only plant 1-2 seeds.

1) Sunflowers
   a. Mammoth Sunflower seeds look just like the seeds that you buy at the store to eat—but don't eat these seeds because they are not clean AND don't plant the ones you buy in the store because those seeds have been cooked so they won't grow
   b. Some other types of sunflower seeds look different (show Autumn Beauty, which is a mix)—black, brown, smaller size
   c. Plants from these little seeds grow very TALL—taller than all grownups
   d. Sunflowers are phototropic—they turn their faces toward the sun over the course of the day
   e. Natural birdfeeders—the fully grown sunflowers are full of all the sunflower seeds. If we save those seeds, we can plant them the following year. If we leave the sunflowers and their seeds on the plants to dry, the birds eat the seeds
2) Pumpkins
   a. Pumpkin seeds look the same as the ones you pull out of the pumpkin you carve at Halloween—seeds come from inside the grown pumpkins
   b. Some people cook the seeds from their pumpkin to eat—but don't eat these because they are not clean AND don't try to plant seeds you buy in market because they are cooked so they won't grow
   c. Pumpkins grow on long vines that spread across the ground and make big orange flowers, from which the pumpkins grow
   d. Pumpkin plants have big leaves—the size of your dinner plate
   e. Pumpkins take a long time to grow—we plant now to have pumpkins ready in time for Halloween

Planting Directions:

1) Make rows a foot apart for sunflowers. Plant seeds two inches apart. For Sunflower House, make one row forming three sides of a rectangle or in a circle. Sunflower House should use only Mammoth Sunflower seeds.
2) Plant pumpkins in two-foot wide circle, two feet from neighboring circle. Plant 6-8 seeds per circle. If desired, you may make a small mound and plant pumpkin seeds on top.
3) Each student plants two seeds 1 inch deep. Have students insert their finger up to first knuckle to dig hole.
4) DO NOT COVER UP SEEDS UNTIL ALL ARE PLANTED THEIR HOLES—OTHERWISE YOU WON'T KNOW WHERE THE SEEDS ARE FOR THE NEXT STUDENT.

Pre-K/Kindergarten/First Grade Spring Lesson

Pre-K/K — Sunflower House
1st — Pumpkins and Sunflowers

Today your class will be planting their spring garden with sunflowers, along with pumpkins if you choose. These plantings are linked to several children's stories. Please read the one or more of the following books before your planting:

Sunflower House *by Eve Bunting*
This is the Sunflower *by Lola M.Schaefer and Donald Crews*
The Pumpkin Circle *by George Levenson*

These plants grow very big (sunflowers are very tall, and pumpkins grow on long vines) and take a long time to mature. The plants will not be fully mature until after school is out for the summer. Before school gets out, the students will be able to see how fast the plants grow and how the pumpkins and sunflowers develop. Because the plants grow so fast, it is fun to visit the garden regularly and use a yardstick to measure how much they have grown in just a week. Make a data chart to chart the growth! For more fun, measure the students at the time of planting and then measure them over the course of the growing season to compare their growth rate with that of the sunflowers and pumpkins. Encourage the students to visit the plants over the summer. Remind them to leave the sunflowers and pumpkins growing in the garden so that they are there for the students to study and enjoy when the students arrive back in the fall.

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1.0 Students understand the concept of time and units to measure it; they

understand that objects have properties, such as length, weight, and capacity, and that comparisons may be made by referring to those properties.

1.1 Compare the length, weight and capacity of objects by making direct comparisons with reference objects (e.g. note which object is shorter, longer, taller, lighter, heavier, or holds more).

C) Science—Life Science

2. Different types of plants and animals inhabit the earth. As a basis for understanding this concept:

a. Students know how to observe and describe similarities and differences in the appearance and behavior of plants and animals (e.g., seed-bearing plants, birds, fish, insects).

b. Students know stories sometimes give plants and animals attributes they do not really have.

c. Students know how to identify major structures of common plants and animals (e.g., stems, leaves, roots, arms, wings, legs).

2) First Grade

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2. Plants and animals meet their needs in different ways. As a basis for understanding this concept:

a. Students know different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places.

b. Students know both plants and animals need water, animals need food, and plants need light.

c. Students know animals eat plants or other animals for food and may also use plants or even other animals for shelter and nesting.

e. Students know roots are associated with the intake of water and soil nutrients and green leaves are associated with making food from sunlight.

Please visit the garden regularly to watch your plants grow! We recommend bringing your class to the garden weekly to observe and measure (make a data chart!) the growth of your plants. We will hold an Open House in June to talk to your students about their garden.

Have a Worm Party! &
Worm Facts: Food, Home, Help

Created by Marie Sayles, Garden Educator
Sunset Elementary, San Francisco Unified School District

LESSON SUMMARY

In this lesson, students will learn basic facts about worms, specifically what worms eat, where they live, and how they help the garden.

LESSON OBJECTIVES

Students will be able to:

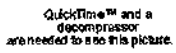
- List worm facts, including diet, habitat and benefit to the garden
- Learn to handle garden creatures gently
- Enjoy the school garden as a classroom

ASSESSMENTS

Students will...

- Demonstrate the ability to handle worms gently.
- Write or copy three foods that worms eat from the class list.
- Write or copy two places that worms live from the class list.
- Write or copy one benefit that worms provide to the garden from the class list.

MATERIALS



- Worms from a worm bin or collect worms from the garden.
- Samples of food scraps and garden waste.
- Newspaper
- Water spray bottle
- Whiteboard/markers
- Paper lunch trays or paper plates
- Clipboards
- Pencils
- Worksheets for each student

BEFORE YOU BEGIN

This lesson can be taught in one long session (45-60 minutes), or broken up into two shorter sessions (20-30 minutes).

PROCEDURES

Part One: Have a Worm Party!

1. Kindergartners are very curious and they need to have time to get to know the worms before this lesson. Start by discussing the garden rules about how to handle creatures in the garden safely.
2. Option to open the lesson by reading a basic worm facts book or story about worms.
3. Ask the students what they know about worms. Make a list of all their ideas. Introduce the worm box or look for worms in your garden.
4. Using their answers, discuss how worms help us (i.e., eat our food scraps, poop it out and turn it into "healthy soil" called castings that helps plants grow). Don't be hesitant to use the word POOP, this is probably the only time kids are allowed to say it in school!
5. Have the students learn how to safely hold and handle the worms. Keep your palm flat. Don't squeeze them. Keep them out of the sun. Put them back in their habitat after a few minutes to rest.
6. Give them a chance to explore and get comfortable with the worms at the **Worm party.**
   Set up three stations:
   -Have the students be "worm chefs" and cut up food or garden scraps with scissors into bite size pieces to feed to the worms in the worm bin.
   -Have students "put the worms to bed" by ripping newspaper into 1 inch strips for bedding in the worm bin. Let them add it to the top of the worm bin. Spray the bedding with a water spray bottle to moisten. Explain that this keeps their home moist and dark.
   -Have students look at "worm spaghetti" by placing a scoop of worms/castings on a paper plate or paper lunch tray and give them a magnifying glass. Work in teams of 2-3.
7. Have the students rotate through the stations.
8. If there is time, have students that have finished go into the garden and look for "wild" worms.

Part Two:

1. Gather students together to discuss what you know about worms.
2. On a whiteboard make a chart like this:

WORM FACTS	
What do worms EAT?	
Where do worms LIVE?	
How do worms HELP?	

3. Ask each question and fill in the chart clearly with a few answers. Food: food scraps, fruits and vegetables, banana peels, newspaper, dead plants). Remember that worms are vegans, and prefer veggies. Don't put oil, dairy or meat in your worm bin.
   Live: Worm bin, garden, soil or dirt
   Help: Poop out soil, help plants grow, eat our waste
4. When students finish the facts, have them draw a worm in their worm badge. Later, these could be laminated with a yarn string to wear as a necklace.
5. Pass out the worksheets and pencils (and clipboards, if needed) and instruct the students to use the whiteboard to help them fill out the Worm Facts chart.
6. Option to pass out set up trays of worms for the students to draw/illustrate their worm. Set out magnifying glasses. Encourage them to label any worm parts they can identify. (mouth, head, tail)

RESOURCES

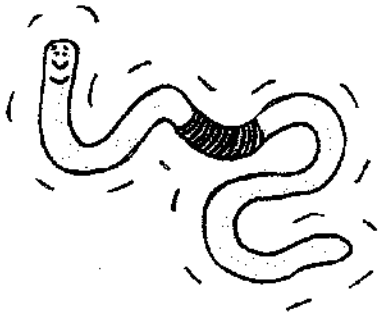
There are a ton of great worm websites and books out there. Look in your school library first! Kids love worm facts, so have a list of them ready to discuss.

Books:
Wonderful Worms by Linda Glaser
Diary of a Worm by Doreen Cronin
Wiggly Worms at Work by Wendy Pfeffer

Online:
Adventures of Herman the Worm: http://urbanext.illinois.edu/worms/
Get a Worm Education packet: www.sfenvironmentkids.org/teacher.htm

Name _____ Room _____

My Worm Facts



1. What do worms eat?

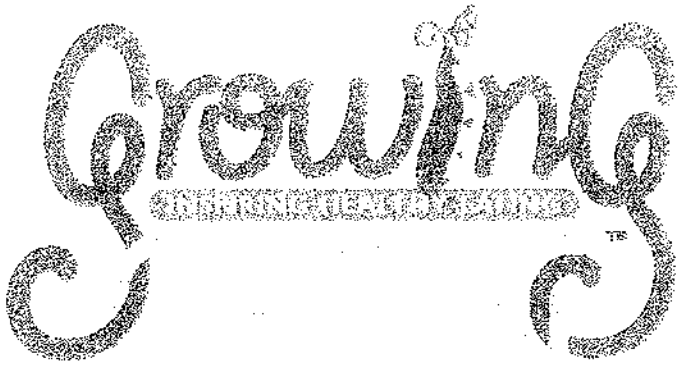
2. Where do worms live?

3. How do worms help the garden?

Draw a picture of a worm in its home:

WORM BADGE

My Name _____



Kindergarten Fall Garden
Tops and Bottoms Salad Garden

Objective:

Students will learn that the vegetables they eat come from different parts of the plant and be able to identify the primary parts of the plant and whether the vegetable grows above or below the ground.

California State Content Standards:

Science

2b: Students know stories sometimes give plants and animals attributes they do not really have.

2c: Students know how to identify major structures of common plants and animals (e.g., stems, leaves, roots, arms, wings, legs).

4c: Describe the relative position of objects by using one reference (e.g., above or below).

Language Arts

2.0 Reading Comprehension.

Comprehension and Analysis of Grade-Level-Appropriate Text

2.2 Use pictures and context to make predictions about story content.

2.3 Connect to life experiences the information and events in texts.

2.4 Retell familiar stories.

2.5 Ask and answer questions about essential elements of a text.

Materials:

Seeds: Carrots—Thumbelina or Nantes
Radish—Easter Egg or Cherry Belle
Lettuce—Red and Green varieties
Broccoli—DiCicchio

Lesson:

This lesson is based on the book "Tops and Bottoms" so you or the teacher must read the book before the lesson, and you must have the book on hand during the lesson. Point to the book throughout lesson to reinforce concepts. This lesson is best done as a question/answer (i.e. "When Bear said he wanted the tops of the plants, Rabbit tricked him by planting vegetables that only taste good on the bottom. What vegetables do we eat that grow under the ground on the bottom of the plant?").

Today we are planting a special salad garden that will teach use about the different parts of plants that we eat when we eat a salad. Today you will each get to plant some vegetable seeds. Then, you will get to watch your garden grow for the next few months. After the Winter Holiday break in January or February, you will have a special party where you get to harvest all the vegetables from the garden and eat a delicious salad that you grew!

Like Rabbit in the *Tops and Bottoms* story, we are going to plant some vegetables that only taste good on the bottom, some that only taste good on top and some that we eat only the middle.

For the bottoms, we will plant carrots and radishes. Do we eat the leaves of the carrot or radish plant? (Point to pictures of carrot and radish leaves in book). No, we eat only the bottom or the "root" of the carrot and radish plant.

For the tops, we will plant lettuce. When we eat lettuce, we are eating the leaves of the lettuce plants. Do we eat the roots of the lettuce plants (point to picture of lettuce roots in book). No, we eat only the leaves.

For the middles, we will plant broccoli. In the book, Rabbit plants corn. We are not planting corn because it is not the right season for corn to grow. Corn only grows in very warm weather—during the summer. Is it summer? No, it is fall and the weather is getting colder. It is too cold to grow corn. Instead we will grow broccoli, which likes to grow in the cool weather of fall and winter. Broccoli is a "middle" because it is the flower bud of the broccoli plant. We leave the roots and leaves of the broccoli plant and just cut the flower buds out of the middle to eat.

Garden Rules:

1) **IMPORTANT REMINDER Plants can be poisonous:** Plants and flowers in the school garden are safe for eating because we plant them specially for food and do not use any chemicals or pesticides that would be harmful if eaten.

•Children must NEVER eat a plant or flower they find growing anywhere at school, home or in their neighborhood unless their parent or another responsible adult says it is ok!!!

•Many plants are VERY POISONOUS. Plants are tricky because many look alike. You may think it is a plant that is safe to eat, but it may not be.

•Many people put chemical pesticides on their plants to kill bugs or give plants special food called fertilizer that is safe for the plants, but not safe for people. These chemicals are NOT SAFE for people to eat!!!

2) **Quiet voices, no running**—do not disturb the creatures in the garden or the students in nearby classrooms. The garden is a classroom just like all the other classrooms at school. All the same rules as in your classroom, like no running, yelling, climbing, apply in the garden as well.

3) **Listen to instructions** and plant as you are told our your plants may not grow. If you plant too many seeds or put the seeds in the wrong place, your seeds will not grow.

Planting Plan:

- Students will each get to plant one type of seed to plant
- We will assign each student the type of seed or plant they get to plant

It doesn't matter what you plant today—the entire class will share the whole salad. You will get to taste everything planted today, and you will not have to eat anything you do not want to eat at the harvest party.

Planting Directions:

For all seeds: Make rows a 6 inches apart and ¼ inch deep. Have students place seeds 1 inch apart in row. Easiest if you hold seeds and students pinch them from your hand/cup one at a time. Do not let students dig holes for seeds—seeds will be planted too deep and will not grow. Have students pinch dirt closed and gently pat down to cover rows after they place their seeds.

Growing
INSPIRING HEALTHY EATING

PEP/Kindergarten Fall Planting

This week your Kindergarteners will participate in the GrowingGreat Garden program. The students will work with our garden coordinator and volunteers to learn about the fall plantings and sow seeds in a garden box (that your class shares with another PEP or K class). All activities through the GrowingGreat Garden program support California State Standards in science, language arts, or social studies. Here are the details for your fall planting:

Tops and Bottoms Salad Garden

This garden is based on the book *Tops and Bottoms* by Jan Stevens. Please read the book to your students before the planting. The story teaches students that the different vegetables they eat come from different parts of the plant. Just like rabbit in the story, the students will plant "bottoms," "tops," and "middle" vegetables. Carrots and radishes are the "bottoms," lettuces are the "tops," and broccoli is the "middle."

This garden supports the following California State Content Standards:

Science

2b: Students know stories sometimes give plants and animals attributes they do not really have.

2c: Students know how to identify major structures of common plants and animals (e.g., stems, leaves, roots, arms, wings, legs).

4c: Describe the relative position of objects by using one reference (e.g., above or below).

Language Arts

2.0 Reading Comprehension.

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2.5 Ask and answer questions about essential elements of a text.

Please visit the garden throughout the fall and winter to watch the garden grow. We will plan a harvest party in late winter.

Treasure Hunt and Share

Created by Rusty McCall, Garden Educator
Cesar Chavez Elementary, San Francisco Unified School District

Lesson Summary

In this lesson, students will use observation and oral language skills to choose and describe garden treasures. They quietly tiptoe through the garden in pairs, looking at the ground. They have 1-2 minutes to find a natural treasure - a rock, feather, leaf, bark, roly poly, etc. They should not pick pieces of live plants. When time is up, they must bring their treasure back, make a circle, and have show and tell. Repeat. *No formal lesson plan needed. Grades K-1 (adaptable for older students)

Lesson Objectives

Students will be able to...

- Work in pairs.
- Use observation and oral language skills in pairs and whole group.
- Listen to and understand classmates.

Assessments

Students will...

- Share their object in the circle.
- (optional: Use sentence frames to talk about their object.)

Materials

- (optional: Collection cups that could contain a bug)
- (optional: Board or wall space to list found objects)

Before You Begin

✓ Set up optional materials.

Procedures

- (Inside/before entering garden if possible) Introduce the definition of garden treasures and share one with the class in the format that you want them to follow.
- Ask students to call out rules for the class when spending time in the garden.
- Assign pairs and have one pair do a trial run. They can pick one object together or one each if they can't agree on one. You probably don't want them to pick plant pieces, but that's up to you to specify.

- They quietly scavenge for 5minutes.
- When they hear the signal you've set up, they regroup and circle up. Alternately, to enforce more order, you could walk in a line and have pairs pick things as the line moves around the garden. This might make it easier to circle up.
- In the circle, pairs share what they found and why they chose it. Teacher can make a list if (s)he wants.
- If there is time, you can replay this activity. Some students might even want to trade with each other. Stress that animals must be handled gently and returned to their habitats at the end of class.

OTHER IDEAS

- Have students, especially older students, look for a certain type of treasure. For example, find a decomposer or a flower or a stem...

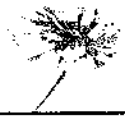
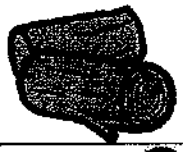
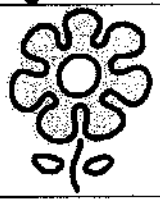
Alphabet Hike

Feel, smell, watch or listen to something from each letter of the alphabet. Write down or draw what your discoveries.

A		N	
B		O	
C		P	
D		Q	
E		R	
F		S	
G		T	
H		U	
I		V	
J		W	
K		X	
L		Y	
M		Z	

Name _____ Room _____

Counting Garden Hunt

Find	Draw a picture
1 bee 	
2 leaves 	
3 flowers 	
4 logs 	
5 petals 	
6 legs 	

Food From Trees

Created by Kelly Nichols, Education Outside Corps Member
Hillcrest Elementary School, San Francisco Unified School District

Lesson Summary

In this lesson, students sample a variety of foods that come from trees and use their five senses to describe them.

Lesson Objectives

Students will be able to...

- Name some foods that come from trees.
- Recognize pictures of tree crops in their natural state.
- Use their five senses to describe new foods.

Assessments

Students will...

- Identify foods growing on trees.
- Express preferences and give oral descriptions of new foods.

Materials

- White board
- Markers
- Food that grows on trees (for example: apples, mandarins, almonds, olives, chocolate chips)
- Cutting board
- Apple slicer
- Napkins
- Pictures of tree crops

Before You Begin

- Cut and core apples and separate mandarins into individual pieces.
- Draw a taste preference chart on white board with spaces for each food to be sampled.

PROCEDURES

- Ask students to list any foods they know that grow on trees.
- Hand out napkins to each student.
- Hand out first taste test item (start with familiar foods such as apples and save chocolate chips for last).
- After each student has sampled the food item, have a few volunteers describe the taste with a variety of words. Write these descriptive words on the whiteboard. Students may also be prompted to describe the foods using their other four senses.
- Take a tally of how many students like and dislike the food item and record it on the taste preference chart on the whiteboard.
- Show a picture of the food item as a crop growing on a tree.
- Repeat for each food item. If using nuts, pass around one in a shell for students to feel and examine.
- Before sampling the chocolate chips, show students a picture of cocoa tree and ask them to guess what food it is.
- Ask students to discuss which food they liked the best and why.
- Collect napkins and discard in compost or worm bin.

RESOURCES

- List of some foods and spices that come from trees as well as some other tree related activities: http://urbanext.illinois.edu/trees3/guide.html#3

Bug Hunt! Who lives here?

Created by Marie Sayles, Garden Educator
Sunset Elementary, San Francisco Unified School District

LESSON SUMMARY

In this lesson, students will go on a bug hunt to find and identify garden creatures and their homes.

LESSON OBJECTIVES

Students will be able to:

Identify insects and other creatures by counting the number of legs.
Learn about habitats and where creatures live in their school garden.

ASSESSMENTS

Students will:

Find six garden creatures and complete the "Bug Hunt" worksheet.
Demonstrate how to handle garden creatures gently.

MATERIALS

Diagram or picture of ladybug and butterfly
Clipboards and pencils
Activity worksheet
Bug collectors or containers
Magnifying glasses

PROCEDURES

1. Start by explaining that when someone who studies insects (an insect scientist or entomologist) finds a creature in the garden, they can tell if it an insect or not by counting! All insects have six legs. Other creatures you find in the garden have a different number of legs (like spiders or pill bugs).
2. Introduce the students to insects by reading a K level insect book, such as **Bugs are Insects** by Anne Rockwell or check your school library.
3. Ask the students what they know about where creatures in the garden live. Where are their homes? Give examples and discuss where to find creatures in your school garden.
4. Remind students to be gentle with the creatures. They are collecting them to observe and draw only, then they need to put them back in their home.
5. Pass out the worksheets and pencils (and clipboards, if needed) have the students begin their bug hunt.

BUGS & CREATURES

Name_____ Room ____

NAME of CREATURE	LEGS 	HOME 	DRAW CREATURE

Kindergarten Learning Garden Lessons: Student Pre- and Post-Test

Date: _____ Name: _____ School: _____

Circle one: PRE or POST

Falling into Healthy Shapes

Draw a circle:

Draw a square:

Sorting Out Soils

What things can you find in soil?

_____

Sense of Place

Draw a living thing:

Draw something that has never been alive:

Healthy Eating

Draw a healthy thing to eat:

Going Outside Do you like being outside at school?

Learning Do you like learning things outside ?

What do you like to learn about? _____

NOTE TO TEACHERS: Please mail this pre- or post-test to Captain Planet Foundation at 133 Lucky Street, Atlanta, GA 30303. Cobb Co. teachers may send tests to Sally Creel via CCSD mail. Include teacher name to be included in a drawing for prizes and resources. Also, we'd appreciate your tips and suggestions on Learning Garden lessons you teach: http://captainplanetfoundation.org/learninggarden-resources/

Lesson 1: Fall Into Healthy Shapes

Grade
K

Standards
MCC.K.G.1, MCC.K.G.2, HEK.1

Time
(2) 45 minute periods

Supplies
(per student)
- Shape hunt hand out

(per class)
Sunny window and/or space in school garden
- Potting soil
- Fall vegetable seeds
- Recycled containers of various geometric shapes with small holes in bottom (yogurt cups, milk cartons, take out containers, used nursery pots, etc.)
- Craft sticks or tape and permanent marker for labeling pots
- Book about vegetables, such as: *The Vegetables We Eat* by Gail Gibbons

Overview
Students identify geometric shapes through the act of planting a fall garden through starting seeds in differently-shaped containers and going on a 'shape hunt' in the garden. Students also learn that the vegetables in the garden are part of a healthy diet as they snack on fall vegetables cut into geometric shapes.

Guiding Question
Where is the garden? What is in it?
What shapes are in the garden?
What kind of healthy choices can I make in the garden?

Engaging Students
- Ask students what shapes they can name, and ask for examples of those shapes in their environment (example: circle—car wheel, sun, etc).
- Share a snack of fall veggies (carrots, radishes, etc) cut into geometric shapes.

Exploration
Go on a 'shape hunt' (see hand out) in the school garden.

Explanation
Students can name the shapes they found and used as part of this lesson.

Environmental Stewardship
Students plant veggies in the school garden.

Evaluation
Mastery:
- Students can group similar shapes together.
- Students can draw shapes correctly.
- Students can explain that eating vegetables and exercising are healthy behaviors.

CONTEXT FOR LESSON ACTIVITIES
Standards
MCC.K.G.1. Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.
MCC.K.G.2. Correctly name shapes regardless of their orientations or overall size.

HEK.1.: Students will comprehend concepts related to health promotion and disease prevention to enhance health.
A. Name healthy behaviors

Background Information

Geometric shapes appear regularly in nature. By 'hunting' for shapes in the garden, students learn to recognize basic shapes. Circles, spirals, squares, triangles and rectangles can be found in flowers, woodchips, animals, the shape of garden beds, rocks, etc.

Seeding information:
http://www.hort.vt.edu/HORT6004/network/YouthGardener/Helpsheets/seeds.pdf
http://www.huntington.org/uploadedFiles/Files/PDFs/BGSSseeds.pdf
http://www.gardenbetty.com/2011/03/the-no-brainer-guide-to-starting-seeds-indoors/

Recommended reading:
From Seed to Plant by Gail Gibbons

Teacher Preparation

- GARDEN PREP: Beginning of August—plant bed of carrots (about 2 months till mature).
- Early September—plant bed of radishes (about 3 weeks till mature).
- Week before lesson:
  - Ask students to bring in a clean recycled container (yogurt cup, cardboard drink carton, etc) and be prepared to name the shape of the container.
  - Gather extra containers for students who fail to bring one in.
  - Secure the rest of the materials and supplies.

PROCEDURES FOR LESSON ACTIVITIES

Day 1:

- Inside or outside: Plant fall vegetables in different shaped containers.
  - Fall crops (choose a few): carrots, radish, beets, turnips, kale, collards, lettuce, Swiss chard (to set up for future lessons on plant parts, select seeds for roots (carrot, radish, beet), stems (potato, kohlrabi), leaves (any greens), seeds/fruit (snap peas))
- Collect different shaped containers (or have students collect). For example:
  - Sphere/cylinder: soup cans, to-go containers, old sports ball with top cut off.
  - Square/rectangular: to-go containers, milk cartons with tops cut off.
  - Triangle: build out of cardboard.
- In groups, fill with soil and plant seeds in containers.
- Water and place in spot that gets 6+ hours sunlight/day.

Day 2:

Outside:

- Go on a 'shape hunt' in the garden: ask students to identify as many shapes as possible.
- Plant seeds in geometrical beds.
- Plant seeds in geometrical designs (plant seeds in a circle, square, etc).
- Finish with snack consisting of vegetables that you plant that day:
  - Round radishes
  - Rectangular/conical/circular carrots (depending on the cut)
- During snack, talk about how radishes and carrots are both vegetables that can be grown in the garden, and explain that vegetables are an important part of a healthy diet.

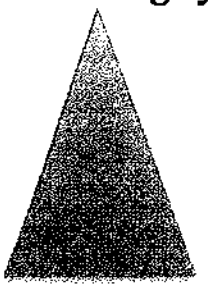
Discussion:

- What shapes did we see?
- What seeds did we plant?
- Name healthy snacks that we can grow in our garden.
- How else can the garden help keep us healthy? (exercise, plants clean air, soil filters water, etc)

Finding Shapes in the Garden

Name:_____

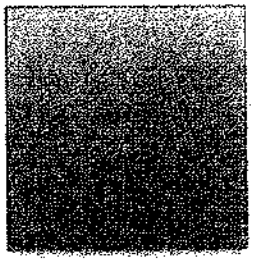
List things you found in the garden that look like these shapes



Triangle

_____

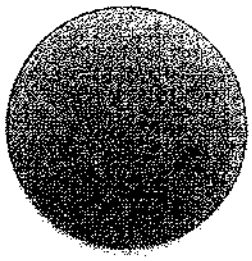
_____



Square

_____

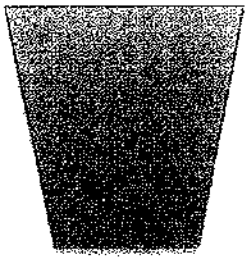
_____



Circle

_____

_____



Trapezoid

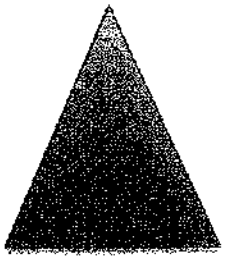
_____

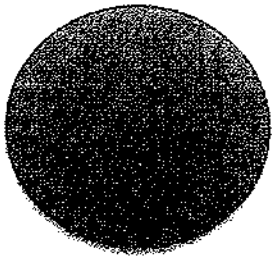
_____

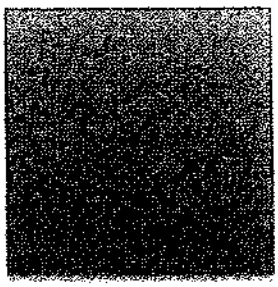
Finding Shapes in the Garden

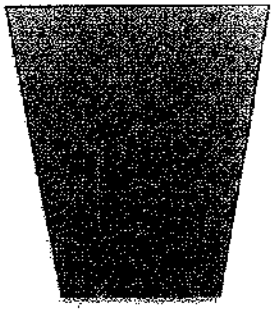
Name:_____

Draw things you found in the garden that look like these shapes









Assessment for Fall Into Healthy Shapes

Student Name(s): _____ **Date:** _____

Subject Mastered → / **Benchmark or Performance Measure** ↓	 **5 pts**	 **4 pts**	 **3 pts**	 **n/a**	**TOTAL POINTS**
Students recognize and name shapes	Students recognize and name examples of squares, circles, rectangles, and triangles in the classroom and garden with 100% accuracy	Students recognize and names shapes in the classroom and garden with 75% accuracy	Students recognize and name shapes in the classroom and garden with 50% accuracy	Students recognize and name shapes in the classroom and garden with less than 50% accuracy	
Students can name healthy behaviors performed as part of the lesson	Students recall two healthy behaviors from the lesson: gardening (a physical activity) and eating vegetables	Students recall one healthy behavior from the lesson	Students name a healthy behavior that was not part of the lesson	Students cannot name a healthy behavior	
TOTAL in LAST BOX →					_/10 pts

Lesson 2: Sense of Place

Grade
K

Standards
SKP1.b, SKL1.a,c,
SSKCG1, SSKCG2

Time
(2) 45 minute periods

Supplies
(per student)
- Paper and pencil/crayons
- Living/non-living sorting guides

(per class)
- Markers and flipchart or whiteboard
- Book about distinguishing living from non-living things, such as: *Is It Living or Non-Living?* by Rebecca Rissman

Overview
Students explore the school garden through their 5 senses and sort items in the garden into living and non-living categories Based on their observations and experience, students create their own agreements for garden safety guidelines.

Guiding Question
Where is the garden?
What is in it: How can I use my senses to discover what is in the garden?
How can I tell the difference between living and non-living?
How can I participate: How can I behave safely in the garden?

Engaging Students
Class 1: Have an 'observation competition,' challenging students to come up with as many observations for each sense as possible (except taste) in the garden. For example: How many different sounds can you hear? How many different smells can you smell? And so on.

Then create a list of living and non-living components of the garden. Come up with a list of criteria for living and non living

Class 2: How do we keep all the living and non-living parts of our garden safe?

Exploration
Observe the garden with the five sense; collect and sort objects in the garden into living and non-living categories.

Explanation
Students can name 'garden guidelines;' students can explain what makes something alive.

Environmental Stewardship
Post Garden Guidelines in the garden so that other students know how to behave appropriately.

Evaluation
- Compare first drawing of garden to drawing from second class.
- Students behave according to the guidelines they create for the garden

CONTEXT FOR LESSON ACTIVITIES

Standards

Georgia Performance Standards:

SKP1. Students will describe objects in terms of the materials they are made of and their physical properties

b. Use senses to classify common materials, such as buttons or swatches of cloth, according to their physical attributes (color, size, shape, weight, texture, buoyancy, flexibility).

SKL1: Recognize the difference between living organisms and nonliving materials.

a. Recognize the difference between living organisms and nonliving materials.

c. Group plants according to their observable features such as appearance, size, etc.

SKL2. Students will compare the similarities and differences in groups of organisms.

b. Explain the similarities and differences in plants. (color, size, appearance, etc.)

SSKCG1 The student will demonstrate an understanding of good citizenship.

a. Explain how rules are made and why.

b. Explain why rules should be followed.

Teacher Preparation

Recommended books:

- *Tops and Bottoms* by Janet Stevens
- *Is it Alive?* By Marcia Freeman
- *Living and Nonliving* by Angela Royston Living
- Helpful chart on what makes something alive: http://www.saps.org.uk/attachments/article/560/SAPS%20Grouping%20&%20classification%20-%20PartB.pdf, pg 4
- Attached: Whats Alive in the Garden worksheet
- Planet Garden: Living and Non Living (b), Schools Interactive Foundation http://www.schoolsinteractive.co.uk/worksheets/eco-ed_worksheets/Planetgdn_Feb2003_images/Planet%20garden%20living%20things(B).JPG

From Schools Interactive website:

Please feel free to download these worksheets from Schools Interactive - each sheet has been developed by Teachers who are aware of the requirements for KeyStage Learning.

PROCEDURES FOR LESSON ACTIVITIES

Day 1: Garden Guidelines

- Introduction to the outdoor classroom/school garden.
  - Draw a picture of the garden.
  - Give students time to sit quietly and observe/experience the garden through their 5 senses.
    - Can be done sitting quietly in pairs or sitting quietly in a circle.
    - Report back: what did you hear/smell/see/touch? Tasting is optional depending on presence of edible plants.
      - Create of list of what is in the garden based on this experience: should include animals, plants, people, etc.
  - Divide the list into living and non-living categories. Students can fill out the attached "What's Alive in the Garden" worksheet or use the attached "Planet Garden" worksheet to draw pictures or paste images from magazines.
- Discuss criteria for what is alive and what is non-living.
  - Does it move all by itself?
  - Does it grow and change?
  - Does it need food/water to survive?
  - Does it reproduce?

Day 2: Garden Rules

- Review lists from first class: what is in the garden, what is living/non-living?
  - Draw a picture of the garden.
  - Discussion: We know about the garden by exploring it through our senses; we can sort objects in the garden into living and non-living categories.

- Ask students to develop rules/guidelines as a class for how to behave and act in the garden in order to take care of what they just discovered exists there—plants, people, animals, materials (tools, soil). Basic guidelines should include some version of respect for self, others, plants, animals, and materials.
- Create a 'Garden Guidelines' document based on student suggestions.
- Students sign/initial/handprint document.

Planet Garden

Living and non-living things (B)

Living things

Non-living things

Cut out the pictures and stick them into the correct box.
Can you add any more of your own?

What's Alive in the Garden?

Name:_____

Draw or write the names of at least FIVE (5) LIVING THINGS you can find in the garden.

Draw or write the names of at least FIVE (5) NON-LIVING THINGS you can find in the garden.

Assessment for Sense of Place

Student Name(s): _____ **Date:** _____

Subject Mastered → / **Benchmark or Performance Measure** ↓	 **5 pts**	 **4 pts**	 **3 pts**	 **n/a**	**TOTAL POINTS**
Understand difference between living and non-living	Categorize items from garden with 100% accuracy	Categorize items from garden with 75% accuracy	Categorize items from garden with 50% accuracy	Categorize items from garden with less than 50% accuracy	
Can describe the garden using all five senses	Can use an adjective for each of the 5 senses to describe the garden (sound, smell, touch, sight, and taste. Taste could be imagined if there is nothing safe to eat in the garden)	Can use an adjective for 4 senses to describe the garden	Can use an adjective for 3 senses to describe the garden	Can use an adjective for 0-2 senses to describe the garden	
Behave according to Garden Guidelines	Can recall the Garden Guidelines and abide by them 100% of the time	Can recall the Garden Guidelines and abide by them 75% of the time	Can recall the Garden Guidelines and abide by them 50% of the time	Cannot recall Garden Guidelines and/or abide by them less than 50% of the time	
TOTAL in LAST BOX →					**_/15 pts**

Lesson 3: Sorting Out Soils

CAPTAIN PLANET'S LEARNING GARDENS

Grade
K

Standards
SKE2.b,c HEK.1.a

Time
(1) 45 minute period

Supplies
Locations:
- Outdoor areas where it is possible to collect 3 small soil samples
- 3 stations set up for groups of students to observe soil samples (could be messy)

Resources:
- trowel or shovel (3 trowels if students will be helping to collect soil samples)
- 6 containers to hold soil samples, 3 of which should be water-tight.

Overview
Students take soil samples to discover that soil is made up of living and non-living components. Students sort soils according to their physical attributes. Students make the connection between healthy soils, healthy vegetables and healthy people.

Guiding Question
What is soil?
Why is soil important?
What qualities does soil have?

Engaging Students
Show class soil samples from different parts of the schoolyard and ask students for educated guesses from where each one comes.

Exploration
Students decide three different locations for taking soil samples around the school yard and come up with explanations for the differences. For example, the playing field has hard, compact soil, versus the planting beds, which may have loose, dark soil. Ask students to notice differences in color and texture.

Explanation
Students can describe the living and non-living components of soil.

Environmental Stewardship
Build a compost pile (see Background Information)

Evaluation
Draw the different components of soil.

CONTEXT FOR LESSON ACTIVITIES
Standards
(outcomes: discover soil is made of living and non-living things; sort soils by attributes; connect healthy soils with healthy food and healthy people)

GPS Science

SKE2. Students will describe the physical attributes of rocks and soils.

b. Use senses to observe soils by physical attributes such as smell, texture, color, particle/grain size.

c. Recognize earth materials— soil, rocks, water, air, etc.

GPS Health: HEK.1 Students will comprehend concepts related to health

promotion and disease prevention to enhance health.
a. Name healthy behaviors
• Identify healthy food choices

Next Generation Science Standards
Core Idea ESS2: Earth's Systems
ESS2.A Earth Materials and Systems

Background Information

Soil is made up of living/once-living (organic matter) and non-living (mineral) components. The organic matter includes: leaves and sticks in the process of decomposition, living organisms (microorganisms like bacteria, fungi, worms, etc)
• Types of soil:
http://www.enchantedlearning.com/geology/label/soillayers/
http://www.epa.gov/gmpo/edresources/soil.html
http://school.discoveryeducation.com/schooladventures/soil/recipe_soil.html
http://www.blm.gov/nstc/soil/Kids/soilimpt.html
• How to compost:
http://web.archive.org/web/20030621193413/http://www.cfe.cornell.edu/Compost/why.html
http://www.highfieldscomposting.org/miscPDF/Do%20the%20Rot%20Thing.pdf
• Recommended books:
Deep Down Underground By Olivier Dunrea

Teacher Preparation

Scout out good locations for taking soil samples.
Set up three stations for observing soil samples; can be outdoor or indoor. If indoor, cover area appropriately to protect from possible spilled soil.

PROCEDURES FOR LESSON ACTIVITIES

- Pose the question: What is soil? What is it made out of?
- Transcribe answers on a chart/whiteboard.
- Take class outside and collect samples of soil from 3 places. Ideally, choose places that appear different from each other. For example, the vegetable garden, ornamental planting beds, and a playing field or pathway.
- To collect sample, first scrape away any mulch/turf covering a small area (about 6" diameter) and put that in a container. Then dig down up to 6" and put that soil in another container. Make sure to not leave a hole in the ground that could trip someone.
- Set up 3 stations so students can observe the mulch layer and soil samples through sight, smell, and touch. You can wet the soil samples to make it easier to feel the texture. Students can even rub soil samples on to white paper to see the color differences.
- Ask students to call out words describing how the different soils:
  - Feel
  - Smell
  - Look
- Ask where students found the most living things (plants and animals)—in which soil sample, and in the mulch layer or soil layer samples?
- Refer back to original list of what students thought soil is made out of, and revise given their experience with the samples. Divide the list into living/once-living (organic matter) and non-living (mineral) components.
- Conclusion/discussion: Different soils have different properties. Soils with high organic matter have more nutrients, making them preferable for growing vegetables. Organic matter can be increased through adding compost. This is one way to help grow healthy, strong vegetables, consumption of which helps make kids healthy and strong.

Assessment for Sorting out Soils

Student Name(s): _____ **Date:** _____

ıbject Mastered → / Benchmark or Performance Measure ↓	 5 pts	 4 pts	 3 pts	 n/a	TOTAL POINTS
Can identify that soil is made of different components	Recall that soil is made up of living and non-living components; the non-living components of soil are minerals and the living components are organic matter	Recall that soil is made up of different components; can name 2-3 components	Recall that soil is made up of different components; can name 1 component	Cannot recall what soil is made of	
Use descriptive words about how soil can feel and look	Use 4 or more descriptive words about how soil feels and looks	Use 3 descriptive words about how soil feels and looks	Use 2 descriptive words about how soil feels and looks	Use 1 descriptive word about how soil feels and looks	
Make the connection between healthy soils and healthy people	Recall that healthy soil grows healthy vegetables that support healthy people	Recall 2 out of the three connections between healthy soil, plants and people	Recall one connection between healthy soil, plants and people	Cannot recall any connections between healthy soils, plants and people	
TOTAL in LAST BOX →					_ /15 pts