



Teacher Guide: 2nd Grade

Index

Introduction

California Education Standards – 2nd Grade

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Lesson 1: Welcome to the Garden and Soil Preparation

Time: 45 minutes

Materials:

Teacher and student workbooks

Pencils, regular and colored

Garden tools: shovels, rakes, hand trowels

Soil Amendment: worm castings, compost, and/or organic fertilizer

Welcome students to their garden.

Use the Garden Time page of the teacher workbook to discuss how their time in the garden will be spent. Establishing this routine will make it easier to manage the class.

Review the Student Agreement in their workbooks. Have them initial or check each item.

Discuss soil preparation for planting peas and the importance of amendments (compost).

Review how to use the shovel. Working tip always down and using foot to push and then pry like a lever.

Explain Group Activities.

Garden Group

Get compost and worm castings. Turn soil and mix in amendments.

Table group:

Do Garden Survey

Decorate Notebook

Make first journal entry

Establish which students are in group A and B.

Divide into groups and switch after approximately 10 minutes.

Save the last 5 minutes to clean up. (Tools, pencils and journals put away)

Garden Time

1 Sit

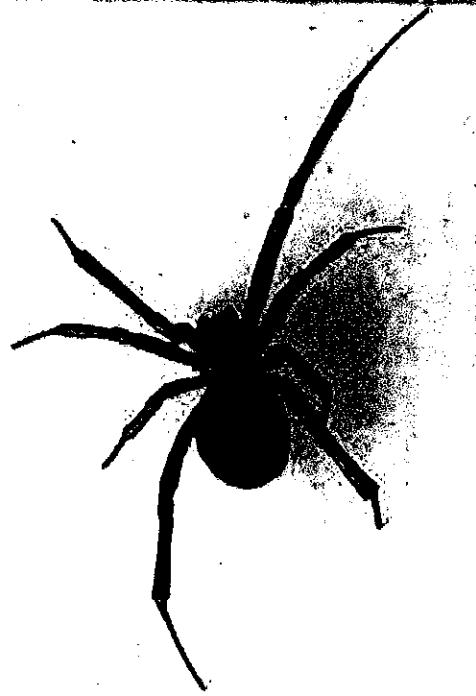
2 Listen

3 Groups

5 Cleanup

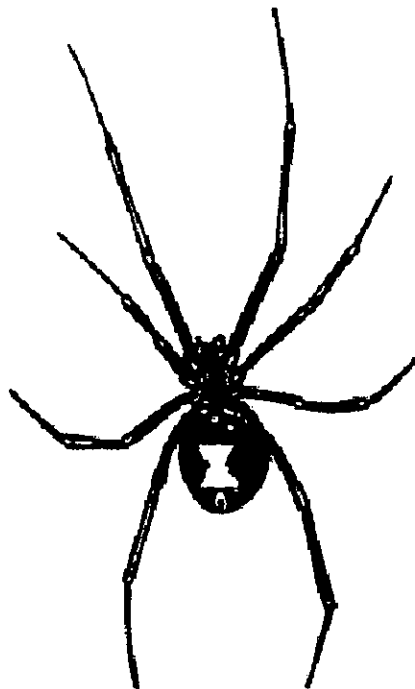
Black Widow Spider

Back
(dorsal)

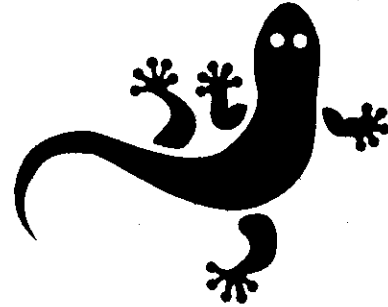


_____ legs

Front
(ventral)





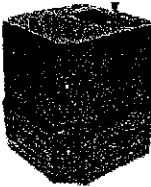

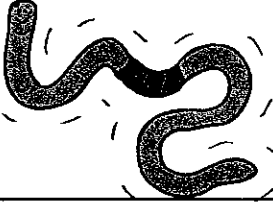

Gecko Garden
Outdoor Science Lab
Student Agreement


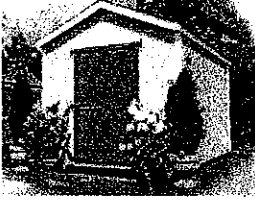

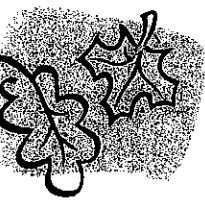
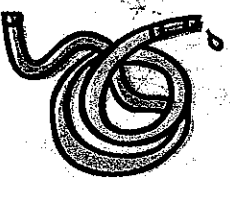



I agree to...

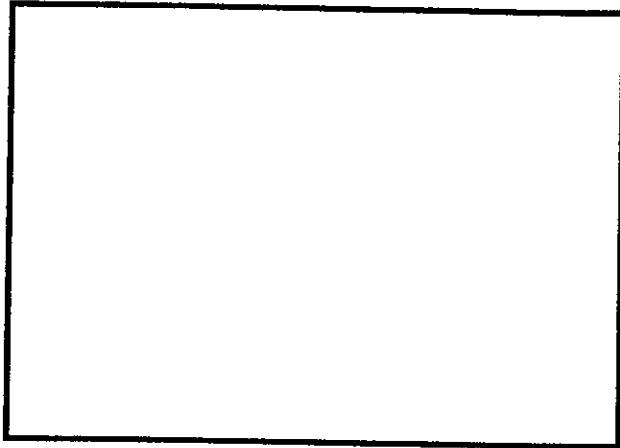
- 1) Use a quiet voice;
- 2) Not run;
- 3) Always keep the working end of tools down;
- 4) Ask before picking or eating any plants;
- 5) Keep my hands out of places I can not see;
- 6) Wash my hands when I am finished gardening;
- 7) Respect plants, animals and each other.

Garden Survey

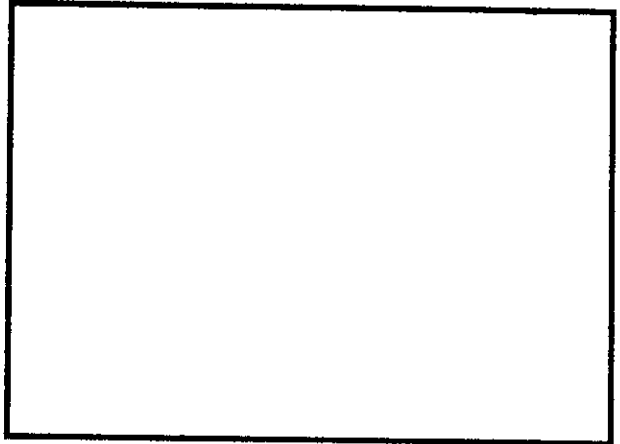
Picture	Word	Alive? Yes or No
	shovel	
	watering can	
	compost bin	
	trowel	
	worm	
	garbage can	

Picture	Word	Alive? Y/N
	flower	
	shed	
	tree	
	leaf	
	hose	
	insect	

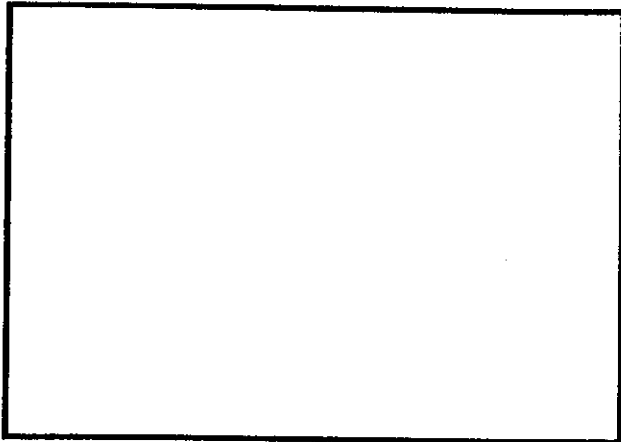
Farmers' Market Crop



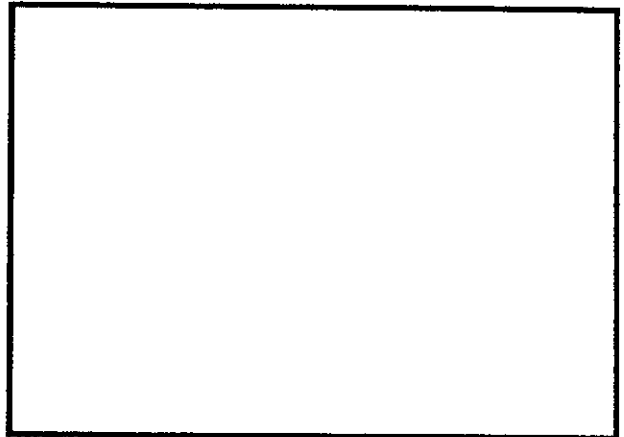
Date _____



Date _____

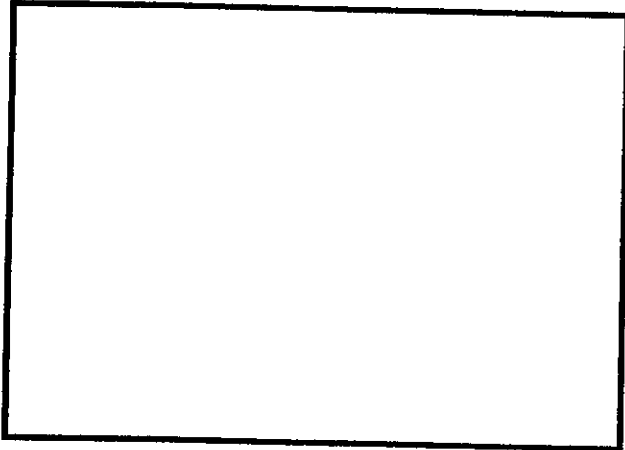


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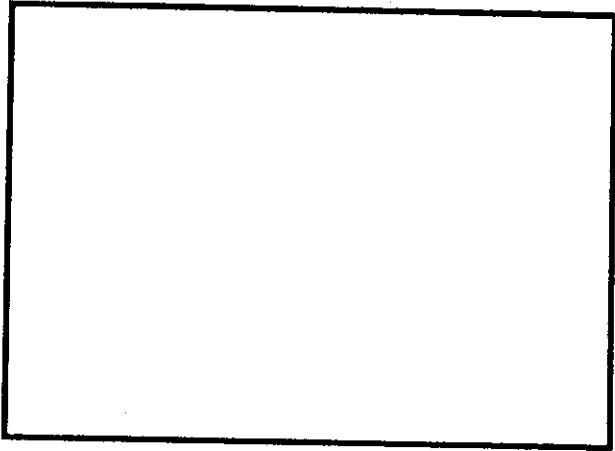


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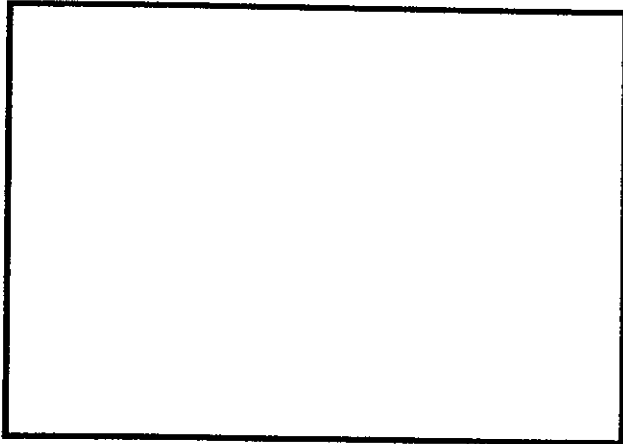
Farmers' Market Crop



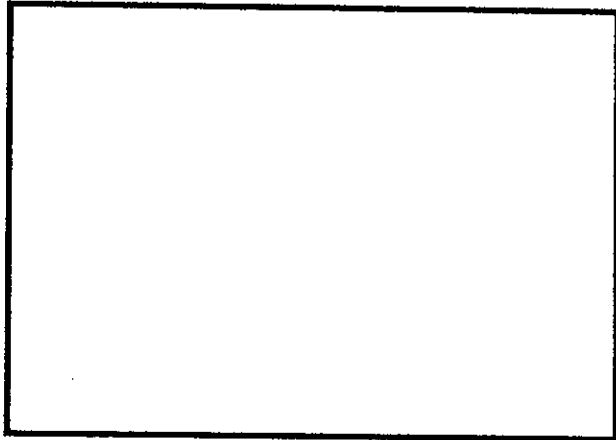
Date _____



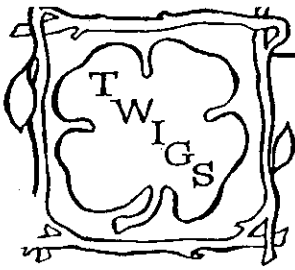
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Date _____



Date _____



Cool Tools

GARDENING ACTIVITY #7

Summary:

Participants will review the proper use and care of tools through skits.

Why Do This?

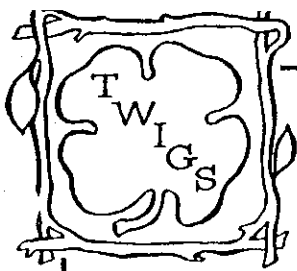
Tools help us do jobs efficiently. It would be an awful lot of work to turn all the soil in a garden with a stick or just with hands! Tools used improperly can hurt people and get broken. If folks have a chance to rehearse the proper use of each tool they will have an easier time remembering proper use in the midst of a gardening project.

Some Helpful Information:

There are different tools that really help out the gardener: A shovel or spade for digging; a hoe for weeding as well as chopping at and smoothing soil. Rakes smooth a wide area and can help collect plant material or rocks. When transplanting, a trowel comes in very handy for digging small holes; a cultivator can remove weeds and aerate the soil. A wheelbarrow is useful for moving soil, compost and mulches from place to place. All these tools are most safely used when some basic rules are followed.

- Walk when carrying tools or using the wheelbarrow.
- Keep tools below shoulder level.
- If an area is crowded wait or move with extra care.
- Clean tools before putting them away.
- Use digging tools like a shovel or spading fork with shoes on.
- Tools on the ground should have blades and points facing down.

Many of us have seen comedies where a person steps on the tines of a rake or the blade of a shovel or hoe. The tool handle pops up and smacks the person in the head. Speaking from experience, it really hurts and isn't funny at all! If the tool is rested upright against a fence or put away this won't happen. If it's necessary to lay the tool down, it should only be left blade or tines facing down into the dirt. (Lying this way they can still trip you up, so take care.)



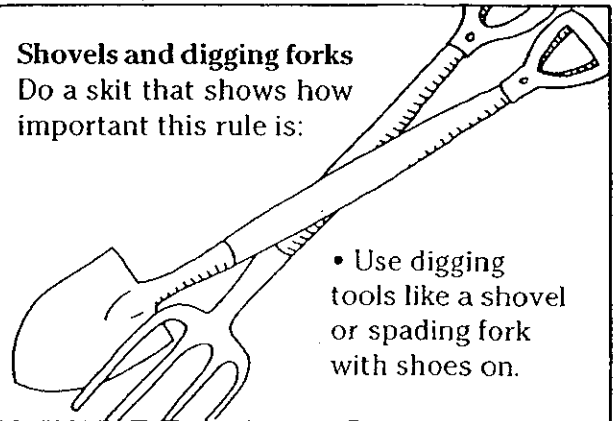
Handout • Gardening Activity #7

COOL TOOLS

Tool Rules:

Shovels and digging forks

Do a skit that shows how important this rule is:

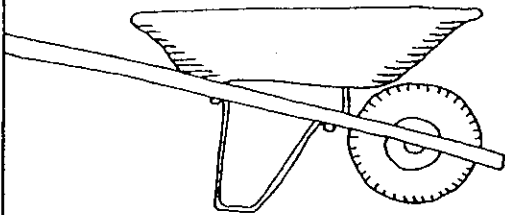


- Use digging tools like a shovel or spading fork with shoes on.

Wheelbarrow

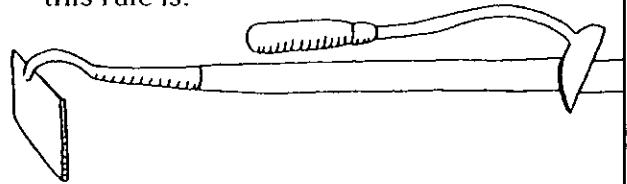
Do a skit that shows how important this rule is:

- Walk when carrying tools or using the wheelbarrow.



Hoe

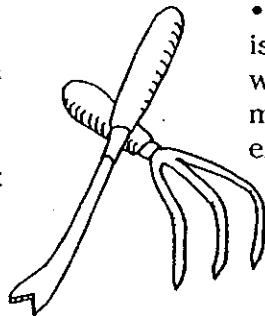
Do a skit that shows how important this rule is:



- Keep them below shoulder level.

Cultivator

Do a skit that shows how important this rule is:

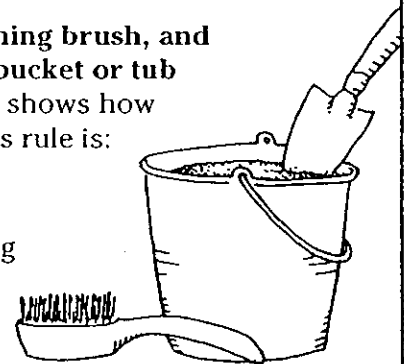


- If the area is crowded wait or move with extra care.

Trowel, cleaning brush, and oily sand in bucket or tub

Do a skit that shows how important this rule is:

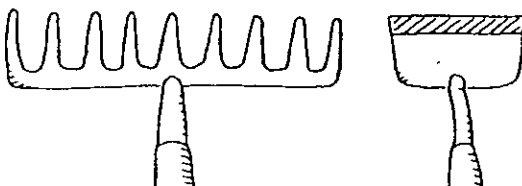
- Clean tools before putting them away.



Hoe and rake

Do a skit that shows how important this rule is:

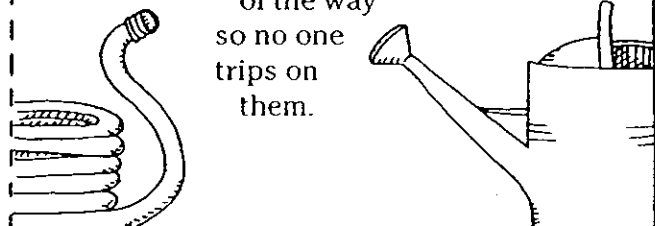
- Tools on the ground should have blades and points facing down.



Hose/Watering Can

- Make sure the hose is off so water is not wasted.

Coil hoses neatly out of the way so no one trips on them.



Compost or Garbage

This game will help teach students about the school compost and recycling program.

- 1) Describe Compost: Nature's way of recycling plants. Makes food for new plants to grow. At Grant we use both compost and vermipost to recycle food and plants.
- 2) Show them the compost sign and talk about what goes in compost.
- 3) Go on a walk to the lunch arbor and show them the compost sign and bin.
- 4) Play a game of 'Compost or Garbage'

optional
if time is
needed

Game

Give each child a real or plastic item that they may come across during lunch time, for example: vegetables, fruits, cheese, ham sandwich, foil or plastic baggie. Have them decide which bin - compost or garbage it will go in. Toss it in!

Additional:

Also include the recycle bin and let students decide which plastic, aluminum and paper items can be recycled.

Gecko Garden

COMPOST

YES

Vegetables

Fruit

Coffee Grounds

Flowers

Plants

NO

Milk

Cheese

Paper

Plastic

Foil

Oil/Fat

Sandwiches



Lesson 2: Planting Peas

Time: 45 minutes

Materials:

- Teacher and student workbooks
- Pencils, regular and colored
- Garden tools: hand trowels
- Pea seeds
- Rulers
- Trellis
- Poles and Netting

NOTE: The trellis and drip line should be secured in the bed prior to planting seeds. You can do this before hand or demonstrate for the students allowing them to help hold it while stakes are pounded in. The drip line should be run along the base of the trellis. Use soil clamps to secure in place. The students should then plant the seeds just along the outside line of the trellis and drip line.

Discuss Farmers' Market and the 2nd grade crop.

Explain Group Activities.

Garden Group

- Install trellis' (2 per bed)
- Plant ½ of the peas along the first trellis (2nd group – 2nd trellis)
- Remove any pillbugs (send them to "Canyon Camp")
- Cover bed with poles and netting.

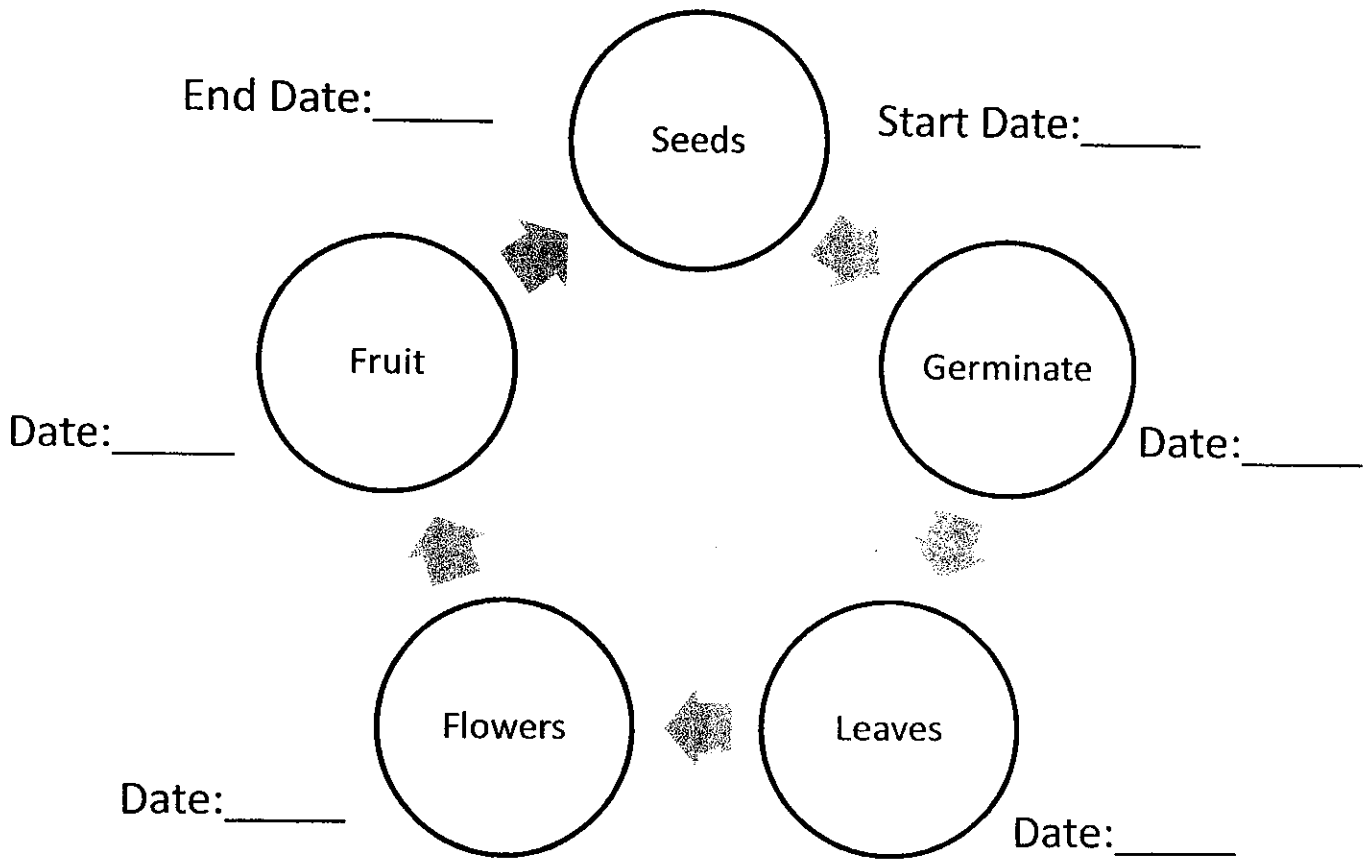
Table group

- Lifecycle of a Pea Plant – enter first date.
- 2nd Journal entry
- Any unfinished activities from last month

Divide into groups and switch after approximately 10 minutes.

Save the last 5 minutes to clean up. (Tools, pencils and journals put away)

Lifecycle of a Pea Plant



Peas

One of the nicest things about gardening is getting to know the vegetables you grow. Living in a world where most of our food is frozen or canned, we risk losing touch with what food looks like when it's growing. Vine-ripened tomatoes, fresh sweet corn, and tender mouthwatering peas fresh from the garden are the three best reasons for having a garden.

SOWING

Tradition holds that you plant peas "as soon as the soil can be worked," but peas actually germinate much more slowly in cold soil. And the colder the soil, the more slowly they germinate: from 9 days in 60°F (16°C) soil, to 36 days in 40°F (4°C) soil. Let the soil warm up a little, or use dark plastic mulch to warm the soil, so the seeds spend less time in the ground. Peas planted a bit later catch up very quickly with those planted earlier.



Sow & Grow

PEAS

(*Pisum sativum*, *P. s.* var. *macrocarpon*)
Pea family (*Leguminosae*)

SOWING

Seed depth: 1" (2.5 cm)

Soil temperature: 40–75°F (4–24°C), the optimum is 75°F (24°C)

Days to germination: 14

Sow indoors: Not recommended

Sow outdoors: As soon as soil can be worked, late summer for fall crop



▲ **Plan in fall for next summer's crop of peas.** Since peas are one of the first crops to be sown in spring, you'll get the most from your pea crop if you get the soil ready for the spring planting in fall by turning in lots of compost or rotted manure.

Ask a bunch of gardeners about how far apart to space pea seeds, and you'll hear everything from ½ inch to 4 inches (1.3–10 cm). I've had good results with very close spacing, about 1 inch (2.5 cm), staggered in narrow bands on both sides

GROWING

pH range: 6.0–7.0

Soil temperature: 60–65°F (16–18°C)

Spacing in beds: 1" (2.5 cm) in a staggered pattern

Watering: Moderate until blossoming, then low

Light: Best yield in full sun; tolerates partial shade

Nutrient requirements: N=low; P=low; K=low

Rotation considerations: Follow with kale.

Good companions: Carrot, celery, chicory, corn, cucumber, eggplant, parsley, early potato, radish, spinach, strawberry, sweet pepper, turnip

Bad companions: Onion, late potato

Seed longevity: 3 years

Seeds per ounce: 200 (7 seeds per g)

of a trellis. Dip the seeds in an inoculative solution before sowing to be sure that nitrogen-fixing bacteria will be present in the soil.

GROWING

You may hear that you needn't fertilize peas because they can get nitrogen right from the air. As with much garden wisdom, this is *almost* correct. The truth is that the bacteria that provide peas with nitrogen don't do this trick at the drop of a hat. It takes a few weeks before the plant actually gets any nitrogen from the bacteria. Meanwhile, the plant has to get its nitrogen from the soil like any other plant. To help them along, when seedlings are 2 to 4 inches (5–10 cm) tall, fertilize them lightly with a complete organic fertilizer.

HARVESTING AND STORING

Like corn, peas are delightfully sweet if you pick them at the right time, but they turn starchy if you don't.

Snow peas. Pick snow peas as soon as the pod reaches mature length but before the peas in the pod are very much developed. Check often: The just-right stage doesn't last more than a day or so.

Sugar peas. These are best when both the pods and the peas are plump and the pods snap like a bean pod. If the pod is stringy, remove the "string" by breaking off the tip and then pulling the string up the inside curve and down the outside.

Garden peas. For best flavor and texture, pick garden peas when pods have filled out but aren't bulging around the peas. Pick all the large ones you missed earlier. Pods left too long on the vine signal the plant to stop producing more peas.

BEST VARIETIES

Garden peas, also called English peas. Flavorful varieties include *Knight*, with plentiful, very early pods on 2½-foot-tall (76 cm) vines; *Lincoln*,

Maximizing Yields

Peas are healthier and easier to harvest when they grow on a trellis (see pages 72–73). If a vine strays from the netting, just direct it back. If the whole mass bulges out too far, attach some garden twine to one end of the trellis, and then weave the twine in and out of the netting strings. Pull the twine taut, and tie the twine to the post at the opposite end of the trellis.



▲ **Mind your peas.** Picked at just the right time, before the peas in the pod have developed very much, snow peas are tender and sweet, but over-large pods are tough and stringy.

a reliable heirloom, bearing long, slender pods filled with sweet peas; *Green Arrow*, a high-yield variety with flavorful peas on 3- to 4-foot-tall (0.9–1.2 m) vines.

Snow peas. Some popular varieties include *Corgi*, with thin, sweet pods that taste great in stir-fries; *Oregon Giant*, with very large pods around sweet, tiny peas; and *Norli*, with early, very high yields of flavorful, sweet pods.

Sugar peas, also called snap peas. Thick, succulent pods hold a host of sweet peas. Look for *Super Sugar Mel*, the best of the sugar peas, with disease resistance, early and heavy yields, and long, sweet pods and *Super Sugar Snap*, a tall (6 feet; 1.8 m) variety bearing loads of sweet, tasty peas.

Lesson 3: Plant Observations & Soil Study, Part 1

California Standards: 2c, 3a, b, c

Time: 45 minutes

Part 1: Plant Observations

Observe, observe, observe! How many leaves do the seedlings have? Discuss vines, tendrils, legumes and look for flowers. How tall are the plants? Look for any signs of pest. Is water ok?

If there are thin spots where seeds did not germinate have students add more seeds.

Record observations in their Farmers' Market Crop Journal

Part 2: Optional Activity: Soil Study

Materials:

- Teacher and student workbooks
- Pencils, regular and colored
- Pea seeds
- 6 pots/class
- 4 glass jars with lids
- water
- soil samples from: canyon(clay), beach (sand), garden bed

Discuss soil components: minerals, particle size and humus

As a demonstration fill jars about $\frac{1}{2}$ full of each soil sample. Fill to top with water. Shake and allow to settle. Let the students observe each as it settles.

In addition to observing the differences between soil types they will be looking at the effects of different soil types on plant growth (environmental effect).

Let each student feel the dry soil and compare how they feel when rubbed between their fingers – smooth and/or gritty?

As a group fill 2 pots with each type of soil: canyon, beach, garden. Plant 3 pea seeds in each. Water them all the same amount, approximately 2 times/week. Bring the pots back to the classroom so the students can water and observe for the next month or two. Put a dowel rod in the middle and tie the vines as they grow.

Soil Study

Soil is composed of minerals and humus. Minerals are pieces of broken rock. Humus is mostly pieces of decomposed plants. Mineral particles come in different sizes. We call these clay, silt and sand.

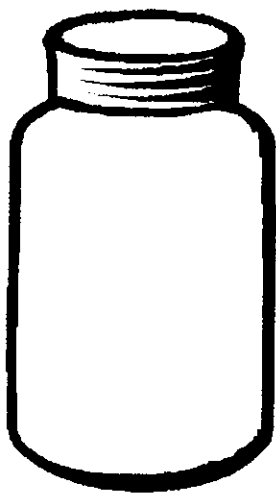
Clay = small particles ○

Silt = medium particles ○

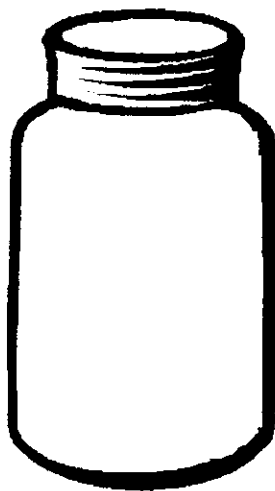
Sand = large particles ○ (not actual size)

When you mix soil and water in a jar, the large sand particles sink to the bottom first; the medium silt particles settle next; and the small clay particles settle on top. Humus will usually float on top.

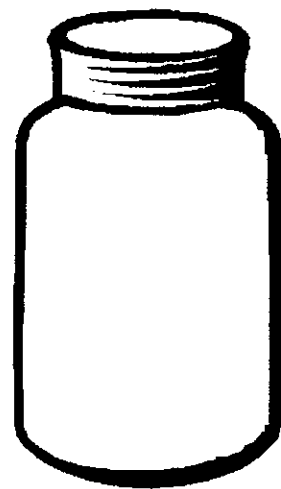
Draw and label the layers you observe in each jar.



garden

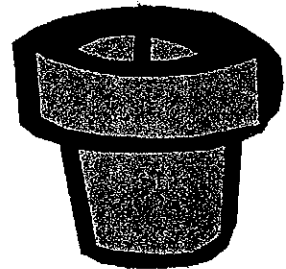
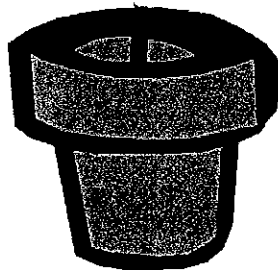
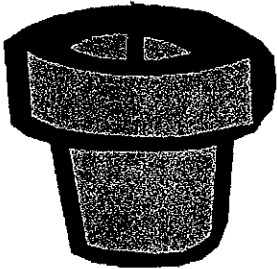


beach



canyon

Soil Study: Plant Growth



The Great Plant Escape

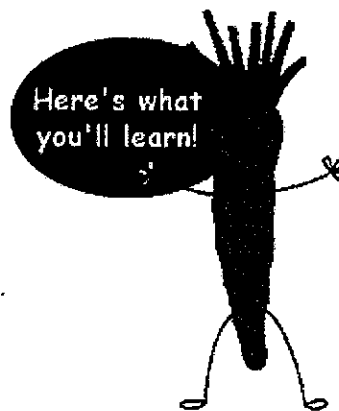
HOME · CASE 1 · CASE 2 · CASE 3 · CASE 4 · CASE 5 · CASE 6 · GLOSSARY · LINKS

Soiled Again!



Facts of the Case

Before you can solve the mysteries, you'll need to learn the facts of the case.



Four Components of Soil

Soil Types

Nutrients from the Soil

Soil for Gardening Indoors

Composting



FACTS OF THE CASE



PLANTS



MYSTERIES



ACTIVITIES

The Great Plant Escape

HOME · CASE 1 · CASE 2 · CASE 3 · CASE 4 · CASE 5 · CASE 6 · GLOSSARY · LINKS

Soiled Again!



Facts of the Case

Four Major Components of Soil

Once you step out onto a piece of ground, you step out onto something that is alive. Soil is not just a piece of dirt. Soil is made up of living and nonliving material spread as a very thin layer over the entire surface of the planet we call earth.

Soil must provide nutrients, water, and air and helps to support the plant.

Soil is a combination of materials. One part of soil is rock that has been broken down over time by wind, water, and chemical processes.

Soil is.....

45%	rock particles
25%	water
25%	air
5%	leaves



Another material is called organic matter. It is made up of decaying plant and animal matter. Water and air are the other ingredients in soil. In a good garden soil, about 45 percent will be rock particles, 5 percent organic matter like leaves, 25 percent water, and 25 percent air.

Next, find out how to tell different soils apart.

The Great Plant Escape

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Soiled Again!



Facts of the Case

Soil Types

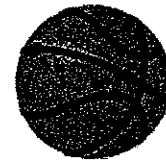
People describe soil types in all kinds of ways such as heavy, light, sandy, clay, loam, poor or good. Soil scientists describe soil types by how much sand, silt and clay are present. This is called texture. It is possible to change the texture by adding different things. Changing texture can help in providing the right conditions needed for plant growth.

Sand is the largest particle in the soil. When you rub it, it feels rough. This is because it has sharp edges. Sand doesn't hold many nutrients.

Silt is a soil particle whose size is between sand and clay. Silt feels smooth and powdery. When wet it feels smooth but not sticky.

Clay is the smallest of particles. Clay is smooth when dry and sticky when wet. Soils high in clay content are called heavy soils. Clay also can hold a lot of nutrients, but doesn't let air and water through it well.

If a particle of sand were the size of a



basketball,

then silt would be the size of a



baseball,

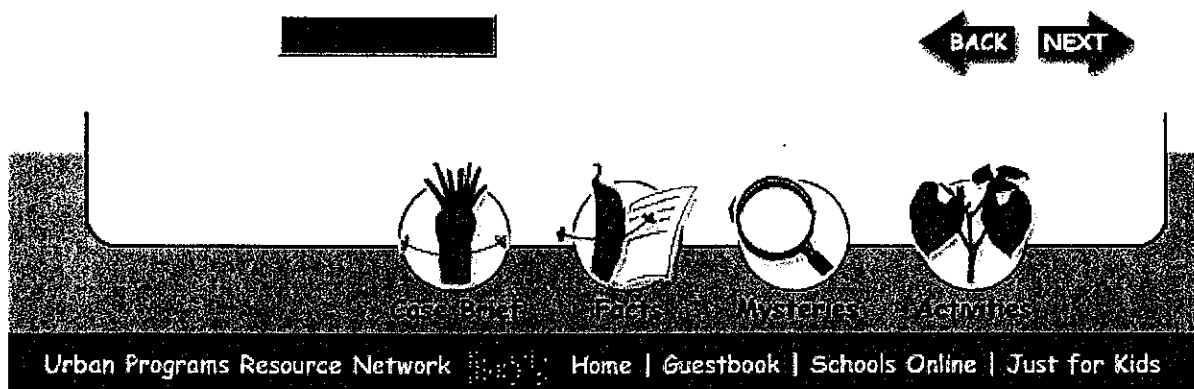
and clay would be the size of a



golf ball.

Particle size has a lot to do with a soil's drainage and nutrient holding capacity. To better understand how big these three soil particles are, think of them like this. If a particle of sand were the size of a basketball, then silt would be the size of a baseball, and clay would be the size of a golf ball. Line them all up, and you can see how these particles compare in size.

Did you get all that? Test what you know by solving Mystery #1.



The Great Plant Escape

HOME · CASE 1 · CASE 2 · CASE 3 · CASE 4 · CASE 5 · CASE 6 · GLOSSARY · LINKS

Soiled Again!



Mysteries

Take a Closer Look: What Is Soil?

You might think that soil is just dirt . . . but it is much more than that! Help Bud and Sprout discover all the things that make up the different kinds of soil.

Print this page and look closely at a handful of soil.

- What color is it?
- What does it feel like? What does it smell like?
- Try separating the soil into different parts. Put like things in piles such as all sticks with sticks, and all roots with roots. Record what you found.
- What else can you tell about the soil?



What did you learn about the soil?

When you're finished, go on to learn why soil is so important...



The Great Plant Escape

HOME · CASE 1 · CASE 2 · CASE 3 · CASE 4 · CASE 5 · CASE 6 · GLOSSARY · LINKS

Soiled Again!



Facts of the Case

Nutrients from the Soil

Most living things need three basic things to survive: food, water, and air. If you said that plants get their nutrients and water from the soil, you are right! Although all green plants make their food by photosynthesis, they also need to get nutrients from the soil. These dissolve in water and are taken up by the roots of the plant.



The most important plant nutrients are nitrogen (N), phosphorous (P), and potassium (K).

Nitrogen helps above-ground leafy growth and gives dark green color to leaves.

Phosphorous encourages plant cell division. Without phosphorous, flowers and seeds could not form. Phosphorous also helps root growth and protects the plant from disease.

Like phosphorous, potassium increases the plant's resistance to disease and encourages root growth. Potassium is needed for the making of chlorophyll.

Now use your new knowledge to solve Mystery #2.

UNIVERSITY OF ILLINOIS EXTENSION 1 TEACHER'S GUIDE CREDITS

The Great Plant Escape

HOME · CASE 1 · CASE 2 · CASE 3 · CASE 4 · CASE 5 · CASE 6 · GLOSSARY · LINKS

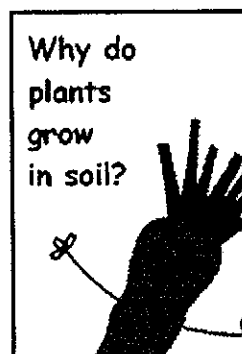
Soiled Again!



Mysteries

Why Is Soil So Important?

Soil is important for plants because it holds roots, stores nutrients, and provides support for plants. Detective Le Plant is searching for secrets in the soil. Help him uncover the ingredients of soil that are important to plant growth.



- What do all living things need in order to live? Clue: Think about what you need to live. Do plants need the same things?
- Which of these things do plants get from the soil?
- What part or parts of the soil do you think contain these things?

Now let's find the names of the three most important nutrients that plants get from the soil. Detective LePlant has also scrambled some other plant words. Print this page and unscramble the words.

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Soil

GARDENING ACTIVITY #2

Summary:

Soil samples are explored to determine what kind of particles they are made of. Soil test kits are then used to determine the nutrient makeup of the soil.

Why Do This?

Food is only as good as the soil it grew from. This activity will have participants look at two soil qualities and gain a deeper understanding of what plants need from soil.

Some Helpful Information:

Half of every plant you grow is underground—roots. The roots need an optimal growing environment if they are to do all the work of gathering and transporting nutrients and water for all the plant's growth as well as giving the plant a place to anchor itself. That's why the nutrients in the soil and the consistency of the soil are as important to your garden as the seeds you plant. Soil is made up of minerals, organic material (such as decaying plants and microorganisms), air and water. All these things interact with plants to keep them healthy.

This activity discusses the different size particles in soil. The three size classifications that gardeners use are **sand** for the biggest particles, **silt** for middle-sized ones and **clay** for the smallest. Soil is made up of a mixture of sand, silt and clay. The ideal mixture for gardening is called loam and consists of 40% silt, 40% sand and 20% clay. Too much clay keeps the soil too wet, then air can't reach plant roots. Too much sand and the soil will not hold enough water, so roots dry out.

For the first part of this activity you'll need to gather soil samples of each particle type. When wet, sand is gritty, silt is smooth and slippery, clay is slippery and sticky. Sand is easy to find at the beach; soil near the beach is often sandy as well. For clay soil you typically have to dig a little deeper. Areas that retain water probably have clay soil beneath them. Soil with organic material (broken-down plants and other living stuff) often have a mix of sand, silt and clay in them. Get soil moist, and grasp it firmly. If it sticks together it doesn't have too much sand. If the moist clump of soil crumbles apart easily it probably doesn't have too much clay either. If it really sticks in a clump it is probably high in clay content.

There are three main nutrients that plants need from soil. **Nitrogen** makes the plant a healthy green. It helps the plants to grow. **Phosphorus** is important for strong root growth. **Potassium** will help the plant grow strong and resist infections. It is simple to test for these elements with an inexpensive basic soil test kit. The results can tell if the garden soil needs something added to ensure healthy plants. There are lots of other minerals and nutrients, but these three are the most important and are easy to test for.

Time:

-2 hour(s)

Materials:

samples of clay, silt and sandy soils

an area to get muddy/dirty

small cups, 3 per group

~~soil test kits, one per 5 or so participants~~

trowels

access to areas to dig different types of soil (or you can provide pre-dug soil samples)

Sample ① garden bed ② Canyon - clay ③ Sand

Preparation:

1. Scout out areas for folks to dig soil samples. Be sure your garden site soil is tested.
2. Gather materials.
3. Review activity to be familiar with steps and information.

Step by Step:

Part One: Soil particles

1. Break into groups of 5 or so.
2. Have each group collect one cup of each soil type.
3. Have everyone in each group look at, smell, listen to as they rub, feel each soil type. They should be comparing them and discussing if they think it is a good soil to grow plants in.
4. Demonstrate to everyone how to add a little water and clump the soil types (see helpful information). Explain that sandy soils fall apart; clay soils stick tightly; and loam soils, the best for growing in, clump and then crumble.

Part Two, Soil test

1. ~~In groups have participants follow directions in the soil test kit. Assign tasks to everyone, such as reader, test tube holder, soil mixer...~~
2. ~~Everyone discuss together what results they found. Which soils need which nutrients?~~

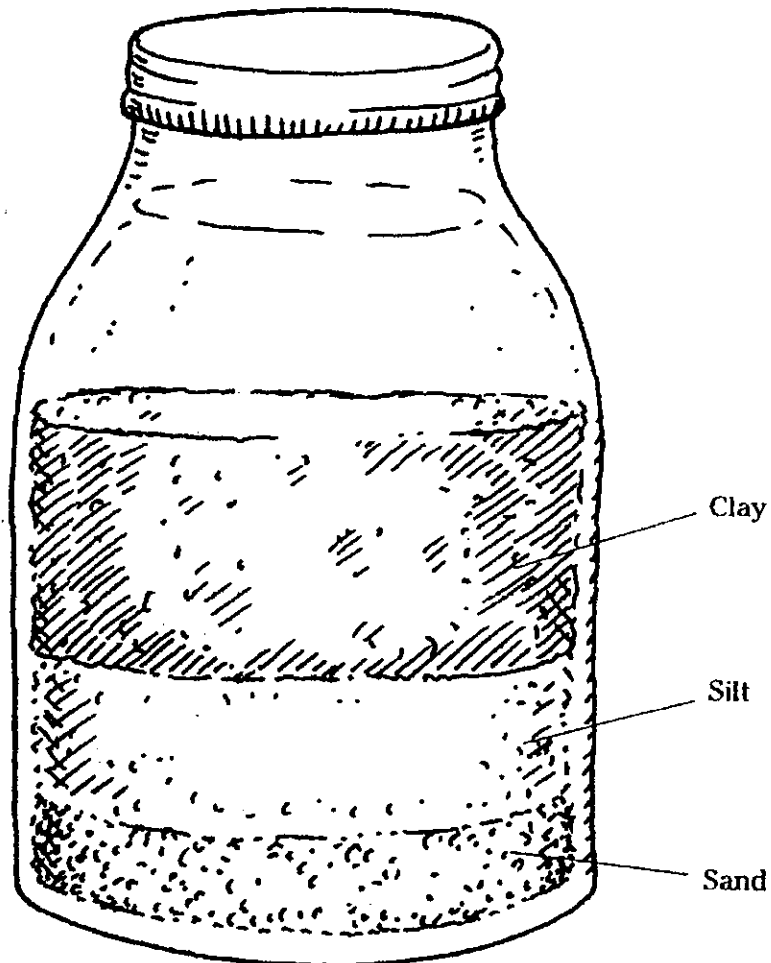
Extensions:

- • Put soil samples in a quart jar with 2 cups of water. Shake well then let the soil settle (for 24 hours). The sand will settle first, next the silt and clay last. Look at the different layers. What is this soil mostly made of?
- Put 2 cups sandy soil in a container then cover with cheese cloth. Add 1 cup water, swirl, then pour water back into measuring cup. How much water came back? Try the same with clay soil and loam soil. How do they differ?
- Have someone from Cooperative Extension come talk about soil.
- Collect soils from home or local farmers and test them for particle size and nutrients.

Handout • Gardening Activity #2

SOIL

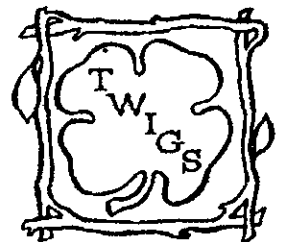
Soil Layers:



Silt and Clay have many small pores so water passes through slowly. Water may move through so slowly that parts of the roots temporarily don't get what they need.

Sand has many large pores, so water passes through readily. Little is retained for use by plant roots. Because of this, you will need to water and fertilize more often.

It is best for gardening to have soil that is a combination of silt, clay and sand—to allow nutrients, water and air to travel through a combination of large and small pores.



Lesson 4: Flowers

California Standards: 2c, 3a, b, c

NOTE: When the pea plants start to produce, the pea pods will need to be picked every 3-7 days. You can bring out the whole class or small groups of students to pick just the ones that are ready (full size, not too thin, but if they get too fat they become bitter and tough). I recommend they use scissors and gently cut off the pod and not pull them with their hands. Pulling tends to damage the vine and reduces yield. I usually have them work in pairs: one cuts, one holds the baggie. Store full bags in one of the refrigerators for up to 2 weeks. Let the students have a sample too.

Materials:

- Teacher and student workbooks
- Pencils, regular
- Scissors and baggies if some peas are ready.

Observe, Observe Observe...again!

Look for flowers, look for pea pods. If any peas are ready for harvest, and it is more than 3 weeks till the scheduled market, have students cut them off the vine, wash and eat! If it is less than 3 weeks to the market the peas can be put into small baggies and saved in the refrigerator for the market.

Look for other flowers in the garden and discuss the roll of the flower for plants, insects and humans.

Optional Activity: Observe the pea plants growing in the pots. Note any differences that may be due to soil(environmental) effects.

Garden

- Observe pea plants
- Harvest peas that are ready
- Walk around the garden and look for other flowers

Table

- Plant Lifecycle Worksheet
- Farmers' Market Journal entry
- Find That Veggie Worksheet (They will need to walk around the garden to do this. You may want to do it as a group)

Save the last 5 minutes to clean up. (Tools, pencils and journals put away)

How does pollination take place in pea flowers?

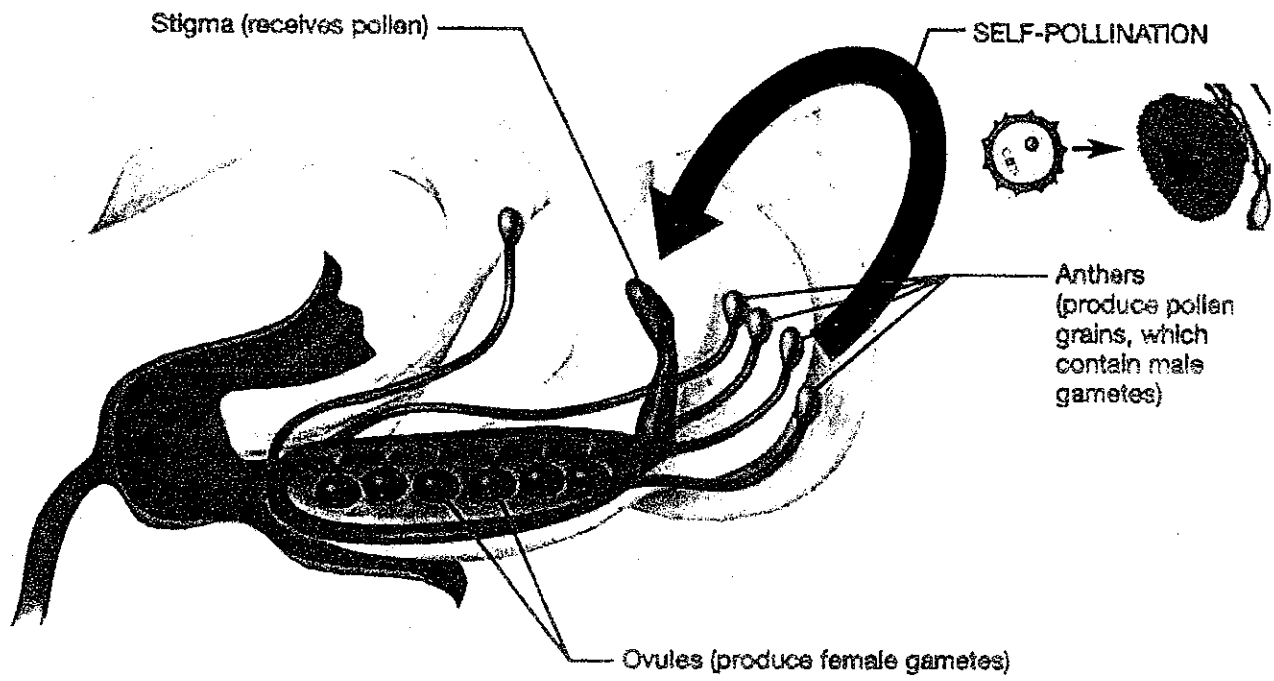
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In: [Botany or Plant Biology](#) ([Edit categories](#))

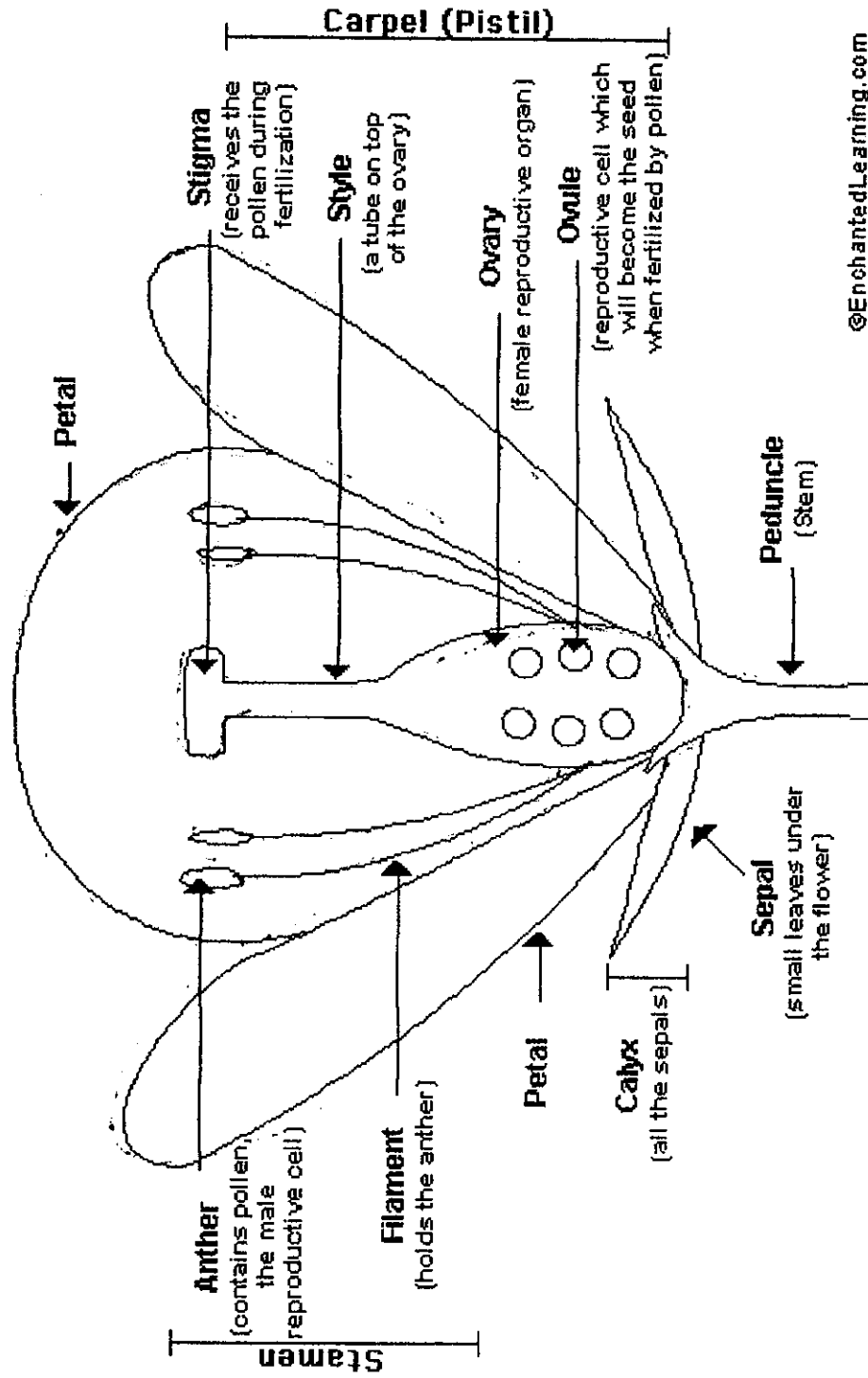
A:

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Pea flowers are self-pollinating. About two days before the flower even opens, the anthers at the top of the stamen, which are the male part, burst and release the pollen. This sticks onto the stigma and fertilizes the ovary - these are the female parts. In many flowering plants, the stigma will not accept pollen from the same plant and fertilization must occur through other means, such as insect pollination after the flower opens. For gardeners, self-pollination is an advantage as it means more than one type of pea can be grown close together, as cross-pollination will not occur.

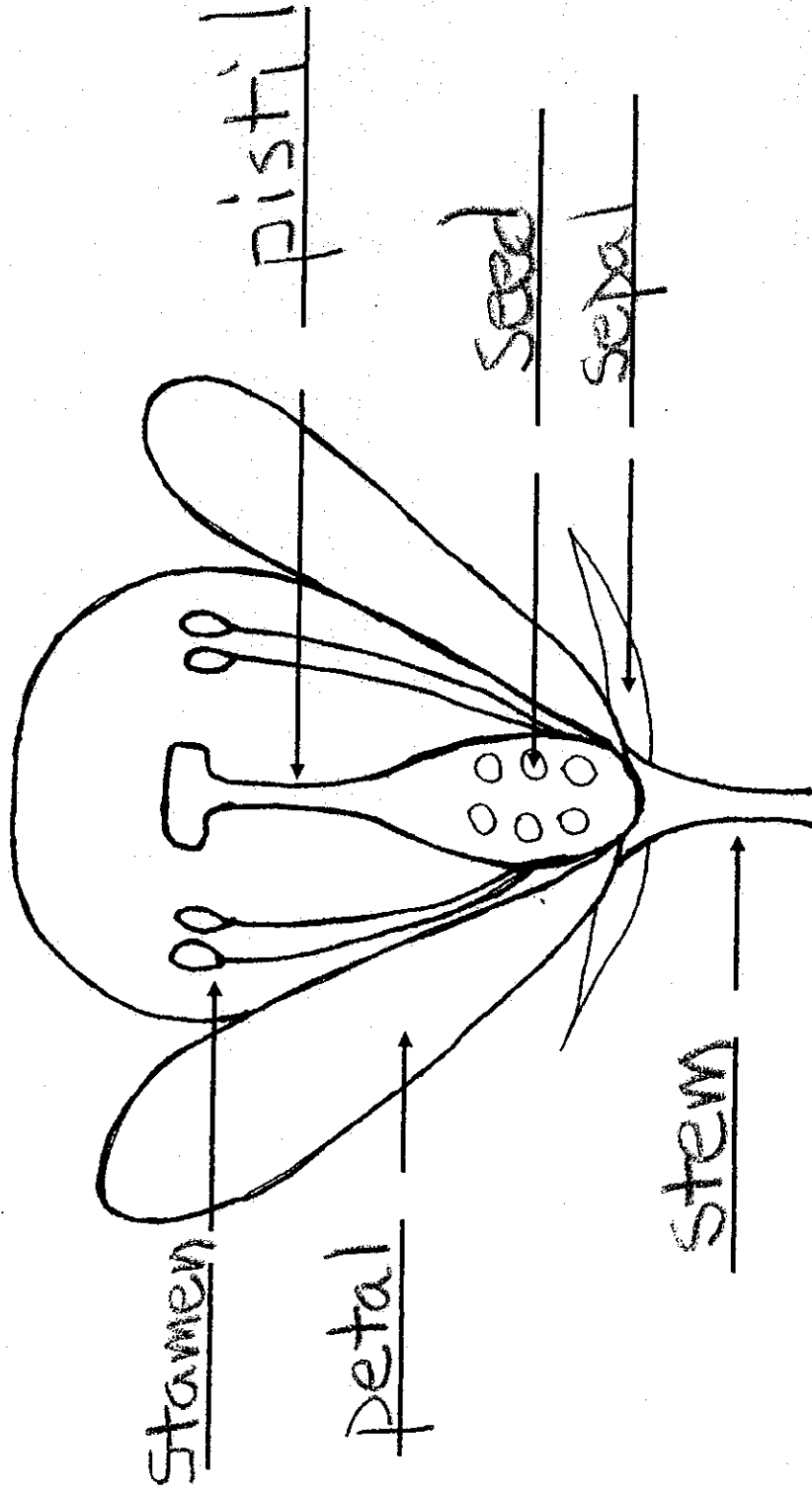


Flower Anatomy



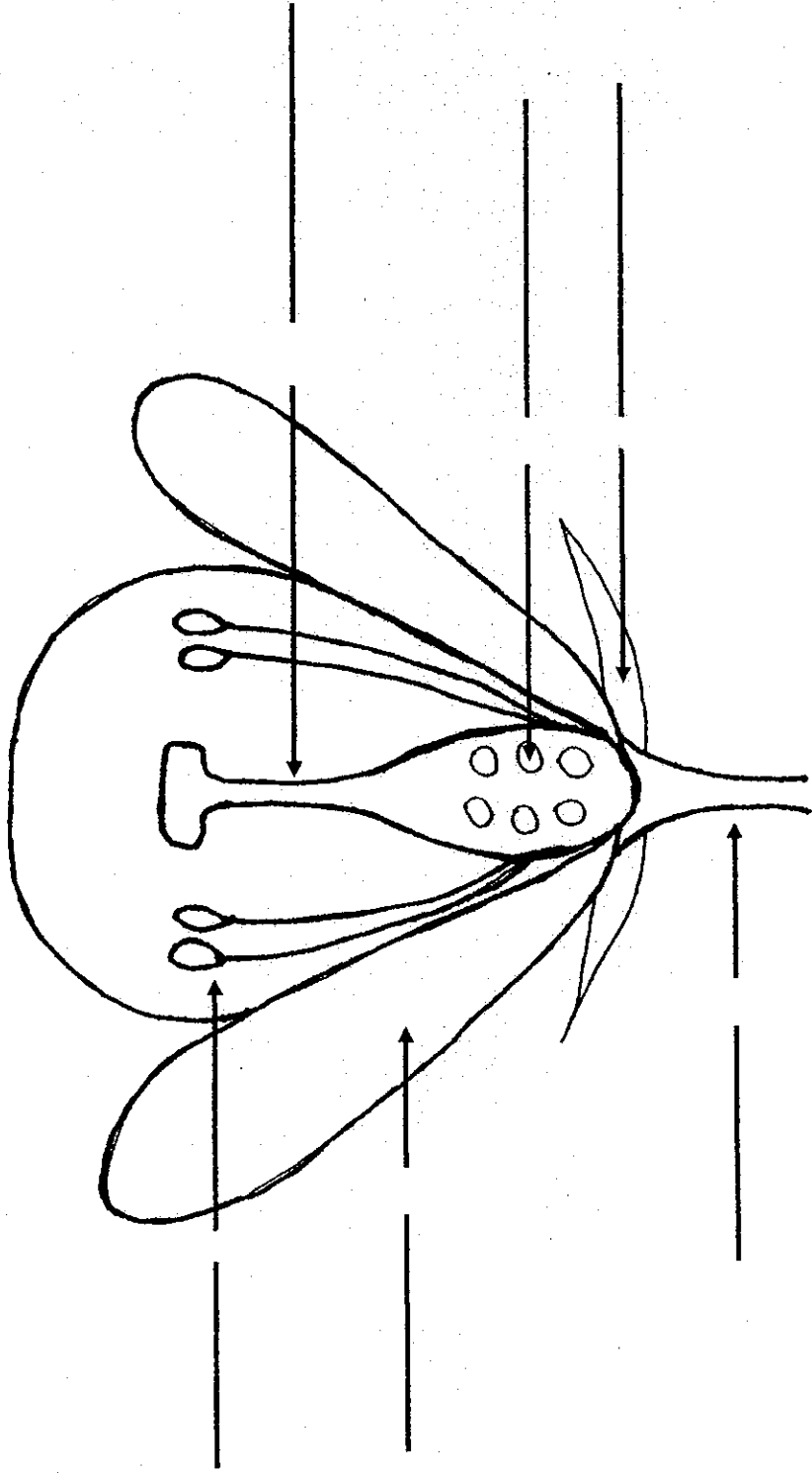
Name: _____

Flower Anatomy



Name: _____

Flower Anatomy



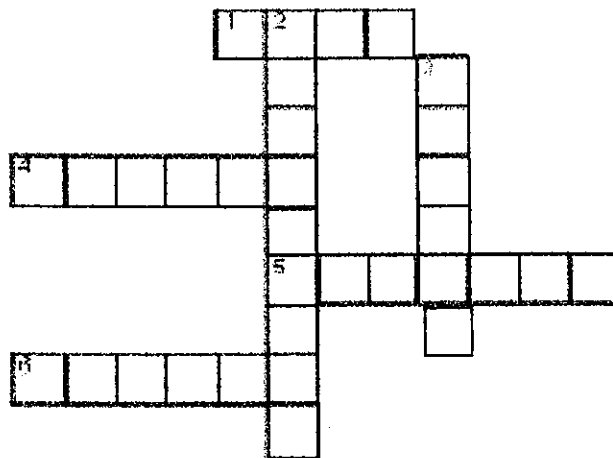
FLOWER POWER

ACROSS:

1. Some plants use the _____, which scatters clouds of their pollen.
4. _____ is the yellow "dust" made by flowers.
5. Sometimes _____ help pollinate plants. They come for the nectar and get pollen stuck on them.
6. The _____ is the part of the flower that needs pollen so a seed can be made.

DOWN:

2. Flowers mix the information found in the pollen and the ovules, so the new flowering plant will not be _____ to its parents.
3. The _____ is the part of the flower that makes pollen.

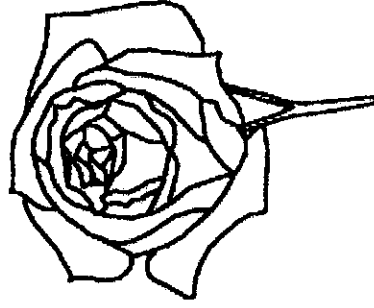
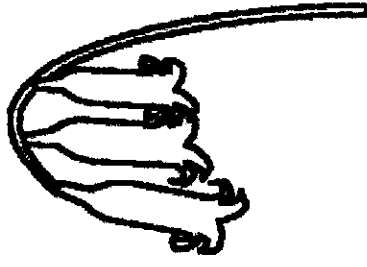
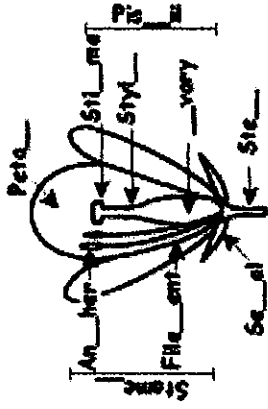


wind	pollen	insects
stigma	stamen	identical

Flower Activity Book



This is a picture of a _____

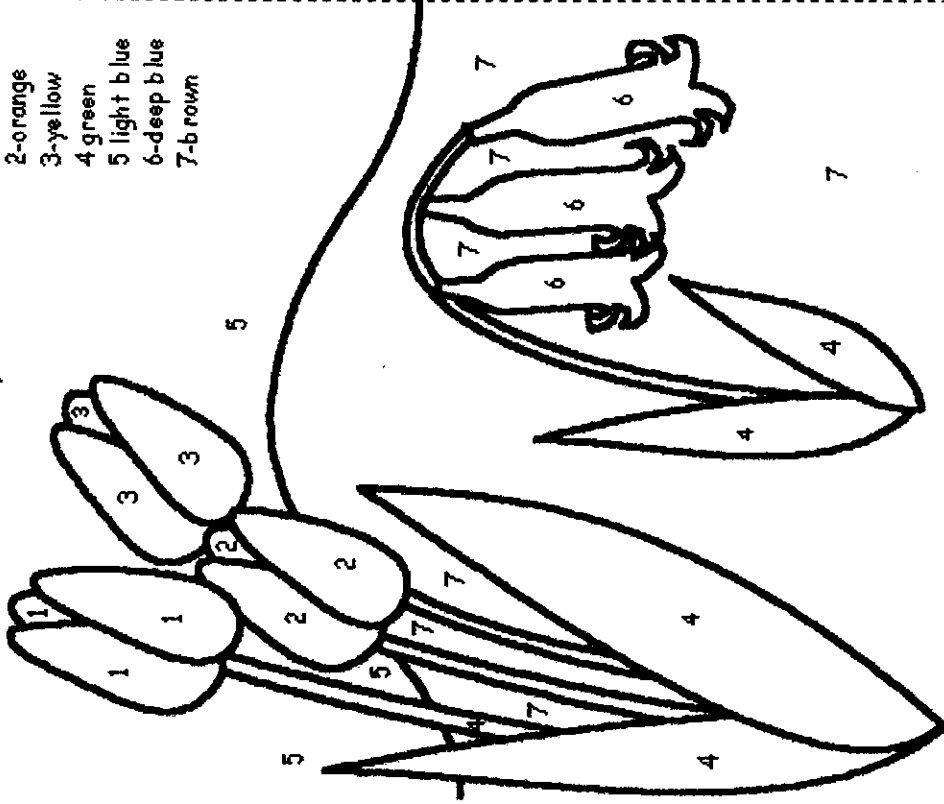


Flower Activity Book

By _____

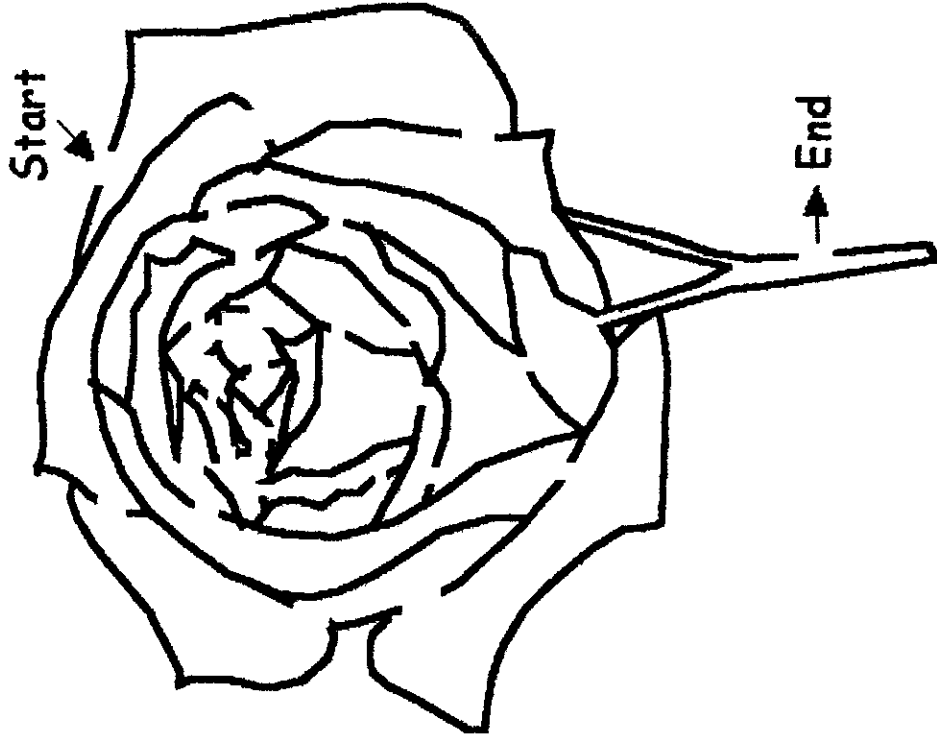
Flower Activity Book

- 1-red
- 2-orange
- 3-yellow
- 4 green
- 5 light blue
- 6-deep blue
- 7-brown



Color the picture by number.

Flower Activity Book



Solve the rose maze.

Lesson 5: Harvest

Time: 45 minutes

Materials:

Teacher and student workbooks
Pencils, regular
Scissors and baggies

Plan:

Discuss how to harvest peas. See note from Lesson 4. Leave a few pea pods on the vine for the seeds to develop. These will be used in lesson 6. If vines are done producing good pods the water can be turned off and vines left to dry for lesson 6, otherwise keep picking and eating!

Explain Group Activities.

Garden

Harvest

Table

Complete any unfinished work:

Find That Veggie worksheet

Journal Entry

Optional: poster

Optional Activity: Each class can create a class poster for display at the student-run Farmers' Market with information relevant to their work in the garden. For example, Soil Types and How it Effects Plant Growth, Lifecycle of a Pea, 'Diary of a Pea!' or just a basic poster advertising their peas. Be creative!

Divide into groups and switch after approximately 10 minutes.

Save the last 5 minutes to clean up. (Tools, pencils and journals put away)

Name _____

Find That Veggie!

Vegetable	Bed Number	Part We Eat (circle one)
carrots		root, tuber, bulb, stem, leaf, flower, seeds
peas		root, tuber, bulb, stem, leaf, flower, seeds
potato		root, tuber, bulb, stem, leaf, flower, seeds
lettuce		root, tuber, bulb, stem, leaf, flower, seeds
onions		root, tuber, bulb, stem, leaf, flower, seeds
radish		root, tuber, bulb, stem, leaf, flower, seeds
		root, tuber, bulb, stem, leaf, flower, seeds

Lesson 6: Completing the Cycle

Materials:

- Teacher and student workbooks
- Pencils, regular and color
- Gloves – if pulling up vines
- Optional: Pots from soil study

If the pea vines are generally done producing pods, turn off the water to the bed and let the vines dry out. Have students look for pea pods that have fattened up with mature seeds. Do not eat these – they are usually bitter. (This is an evolutionary trait so that animals will not eat the seeds of plants that are ready to reproduce.) Observe the seeds. Discuss how they could be planted next year. If the vines and pods completely dry, the seeds can be collected and saved for next years class. Otherwise, just observe and put the vines and old pods in the compost bins.

Review the anatomy and function of the flower. Discuss how the seeds are pollinated in the flower and develop in the fruit.

It's beneficial if you can take some time to review what they learned in the garden over the year. Students can take home their workbooks if no more garden activities are planned.

Optional Activity: Observe as a group the plants that were planted as part of the Soil Study. Discuss the results. Look at all aspects of the plant growth – similarities and differences. Ask the students what are inherited traits versus environmental effects on the different plants. Pull at least one plant from each soil type to observe the differences in the root structures too.

Garden

- Observe pea pods
- Pull up old vines and place in compost bin.

Table

- Complete Life Cycle worksheet
- Farmers' Market Crop Journal entry
- Finish any other incomplete activities

Save the last 5 minutes to clean up. (Tools, pencils and journals put away)