



TWIGS

Youth Gardening and Healthy Eating Curriculum

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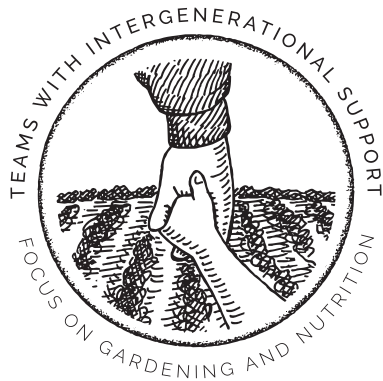
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An agency, classroom, or after-school guide for grades K-6. Lessons can be modified for use with preschoolers and teens.



Introduction

The idea TWIGS (Teams With Intergenerational Support) was born out of the continuing commitment of Cooperative Extension to help youth more fully develop their potential through participation in real-life educational experiences, whether formal or informal. Educational goals are to provide youth with opportunities to learn new skills and knowledge, work together cooperatively, develop decision-making skills, and become productive, responsible citizens of their communities. TWIGS is designed to be community-based and to integrate schools, agencies and the community to focus on the positive development of children.

Intergenerational Focus

The original focus was to provide an intergenerational experience for both children and seniors by recruiting volunteer seniors to partner with youth in educational activities. Through teaming, the exchange between different generations provided awareness and appreciation for each other's values, beliefs and experiences. Self-esteem is built; cooperation skills are strengthened; and respect for experience and sensitivity to feelings are shared. As pilots of the program continued over a five-year period, the intergenerational concept was broadened to include teens, college students and adults as well as seniors. Pilots revealed the mutually beneficial exchange between a variety of generations working together on an educational activity.

TWIGS promotes positive self-esteem, develops decision-making skills, promotes acceptance of responsibility and teamwork. The design of TWIGS addresses the following concerns about and of youth: increased appreciation and interaction among generations; positive use of leisure time; and development of participation and pride in community.

Gardening and Nutrition Emphasis

The garden is a powerful experiential tool that can connect children with science, nutrition, food and fiber production, ecological responsibility and community beautification. It provides opportunities for application of math and science principles, language arts and multicultural awareness.

Not only is there growing interest in the area of children's gardening as a vehicle for education in a variety of disciplines, but documented rationale for connecting children with healthy food sources and nutrition through gardening. A recent report found that more than 59% of children and adolescents (ages 1-18) do not eat enough fruits, 93% of children and adolescents (ages 1-18) do not eat enough vegetables, and the prevalence of obesity among youth aged 2-19 has more than doubled in the past



Introduction continued

30 years, with most of the increase occurring since the late 1970s.^{1,2} Literature reviews show that nutrition education programs have been effective in changing knowledge, but not practice. Research shows that adults who garden eat more vegetables and that gardening can be an empowering strategy that overcomes many of the barriers to increasing vegetable consumption.

Involving children in the development, planting, care of, harvesting and consumption of a vegetable garden has great potential for positively impacting children's attitudes, preferences for, and consumption of vegetables. Implications in the area of nutrition education are positive, yet often are not addressed in gardening programs or curriculums. This lack of connection became a focus of TWIGS-connecting gardening lessons with nutrition lessons.

Pilots also revealed that volunteers, agency staff and teachers want easy-to-use, specific lesson outlines for group activity with adequate information and instructions. Hence, considerable energy was devoted to development of a lesson/activity outline format for volunteers, paraprofessionals and professionals to use in conducting TWIGS. Integrated into the curriculum have been math, science, social studies, history and language arts. Consideration was given to the California Department of Education Health and Science Frameworks in particular. The lessons are meant to be flexibly used, dependent on the needs and interests of participants.

An abundant array of resources and publications exist to provide you with both considerations and information on the development of a garden. The Internet provides links to sources and organizations that provide support and information for those starting a garden, including sources for materials, supplies, funds, etc.

The value of this curriculum is its emphasis on the connection between gardening and nutrition through the provision of 16 gardening lessons and 14 nutrition lessons that give clear guidance to leaders of youth in elementary grades.

1 Fryar, C.D., Carroll, M.D., and Ogden, C.L. (2018). *Prevalence of Overweight, Obesity, and Severe Obesity Among children and Adolescents Aged 2-19 Years: United States, 1963-1965 Through 2015-2016*, Centers for Disease Control and Prevention.

2 *Usual Dietary Intakes: Food Intakes, U.S. Population, 2007-10*, NIH National Cancer Institute.



Curriculum Overview

There are thirty lessons included in the following pages which can flexibly be selected depending on interests of both youth and teacher/leaders, timing of project, and available materials. Each of the activities are written in a 1 ½ hour format. Their development resulted from needs shared by adult teachers/leaders for specific lesson plan guides when working with youth. It is intended that lessons be selected without adherence to numbered sequence, though a normal progression of activities follows the first half of garden activities.

The curriculum is meant to be a useful working tool for adults working with children in the development of a vegetable garden. Very few curricula exist where there is integration of harvesting, food preparation and consumption activities included with gardening. Given the evidence of poor consumption of vegetables and fruits by children and adults and lack of success of nutrition education curricula in impacting behavior, incorporation of both activities together may have great potential for actually positively changing behavior.

A variety of methodologies are incorporated into the curriculum, emphasizing the experiential approach most. Included are: research; reporting; drawing; writing; graphing; dissection of a seed; skits; demonstration; bring items from home; role playing; food preparation; experimenting; and playing a game. Nearly every activity includes a clearly marked "Handout" that teachers/leaders are encouraged to photocopy and share with youth participants. Note those that continue on more than one page.

An alternative shortened version of this curriculum has been delivered and tested by Riverside County. An evidence-based summary on the curriculum and Part 1 option is available on the UC CalFresh website.

Shortened Curriculum Options:

PART 1:

GARDENING ACTIVITY LESSONS:

Activity 2 – Soil
Activity 4 – Speed Magic
Activity 5 – Starting With Seeds
Activity 6 – Ready, Set, Grow
Activity 8 – Wet and Wonderful

NUTRITION ACTIVITY LESSONS:

Activity 3 – Eat Your Plants
Activity 2 – Safe and Clean
Activity 11 – MyPlate, My Colorful Plate

PART 2:

GARDENING ACTIVITY LESSONS:

Activity 7 – Cool Tools
Activity 10 – Compost
Activity 13 – Pest or Pal?
Activity 14 – Worms
Activity 15 – The Spice of Life

NUTRITION ACTIVITY LESSONS:

Activity 6 – Sumptuous Seeds
Activity 12 – Sippin' Soda
Activity 14 – Stir Fry Fun
Activity 13 – Staying Fit with Fiber



Activity Outline

Each of the activities is presented in a similar format.

	TITLE OF LESSON
Summary:	This statement provides a brief description of what the lesson encompasses.
Why Do This?	This provides the rationale and objectives for doing the activity.
Some Helpful Information:	Background information that relates to the activity is given here. Where the topic is more complex, more extensive background information is provided as well as resources for further information.
Time:	Approximate time needed to complete the activity.
Materials:	A helpful listing of all materials needed as you prepare to conduct the activity.
Preparation:	These are notes to teachers/leaders that will help the activity go smoothly. You will find suggestions for how to divide youth into smaller learning groups and considerations for methodology in conducting the activity.
Step by Step:	Actual step by step instructions are outlined for conducting the activity. What comes next and how to do it is laid out simply to minimize teacher/ leader time. All of the activities include experiential or hands-on activities for youth. Most include a clearly marked Handout that youth can take home for future reference.
Extensions:	Listed here are ideas for further exploration of a topic, should you and youth participants be interested. Ideas include suggestions for further discussion of the topic or activities that can be done at home and shared with others when the group next meets.



Gardening Activity Lessons

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Ongoing Garden Chores

Children and adult volunteers should work together to establish a rotating schedule for watering and other routine garden chores. It's a source of pride and accomplishment to all involved when continual commitment yields a beautiful and bountiful harvest.

1. **Watering** - use hose with nozzle (soft spray), soaker hose, or watering cans.

In warm seasons, plants should be checked twice a week to make sure they are getting adequate water. If seeds have been planted, they must be kept moist (not wet) until germination, which will require frequent watering, at least once a day. Young seedlings will also need greater attention and water until they establish their roots in the bed/container.

Children and adult volunteers should check garden beds/containers weekly to perform the following necessary tasks:

1. **Weeding** - keep nutrients in the soil by removing weeds in the beds/containers.
2. **Soil preparation** - add amendments such as manure, compost, etc. to soil and mix into garden beds/containers with appropriate tools.
3. **Thinning** - remove tiny seedlings so remaining plants have room to grow and use the nutrients in the soil. If there is room, transplant seedlings to another bed/container.
4. **Cultivating** - use hand cultivator and loosen soil around individual plants in order to aerate the soil so plants will absorb water.
5. **Fertilizing** - use fertilizer to feed plants.
6. **Mulching** - add a layer of amendments around plants but not on top of them to prevent weeds from growing, to keep moisture in the soil, and to nourish the soil when they decompose. Water well after mulching.
7. **Planting** - sow seeds of fast germinating plants throughout the planting season.
8. **Picking** - pick vegetables when ready.
9. **Maintaining pathways** - Keep paths mud free/dry and weed free.
10. **Deadheading** - snap or cut the dead flowers off stalks to prevent formation of seedpods and to promote more blossoms.

Always remember to use tools carefully, clean them properly, and store them in their proper place!

You are the Expert

GARDENING ACTIVITY 1

Why Do This?

It is empowering to acquire knowledge and share it. Everyone will be an expert on one part of gardening. This information will be used throughout the gardening projects. Whatever phase or part of the garden is being worked on there will be someone who can answer questions or who will know where to look for answers.

Summary:

Groups will pick a gardening topic to research. They will put together a "show and tell" so the others can see what they have learned.

Some Helpful Information:

Gardening comes right after TV and shopping as a favorite pastime or hobby in the United States. This means there are all sorts of books and videos out there that teach about gardening. There are many theories and planting schemes to follow depending on which person or book you believe. We all develop our own gardening style with time and experience.



Used bookstores almost always have some books on gardening that are less expensive than new ones.

Nurseries can sometimes be talked into donating books (and other supplies as well) to your group. Often here are newsletters and pamphlets available for free. If there is a local gardening club (your reference librarian can probably help you find them) it can be a source to find gardening information for your garden library as well. Check with the library for videos they have to lend about gardening or one of the topic areas listed in the preparation section.





You are the Expert

TIME:

2+ hours a week

MATERIALS:

- Reference materials (books, magazines, pamphlets, videos paper)
- Drawing materials

PREPARATION:

1. Collect as many references as possible. Look at the topics and decide which ones will provide the best information for each group.
2. Decide on how many topics and groups to assign. You can make small groups (2-3 people) and give only one topic or divide into a few groups each with a couple of topics. Groups will require an older, accomplished reader to be paired with a youngster.

Topics:

Soil Compost

Watering

Winter Crops

Summer Crops

Transplanting

Harvesting

Starting and Transplanting

Seedlings

Pest control

3. Be sure no one is overly pressured. The experts know where to *find* answers; they don't have to *know* all the answers!

STEP BY STEP:

1. Explain that they are going to be experts so everyone can ask them questions as the garden project progresses. They will learn about their topic and show-and-tell what they found out with everyone. They can do a skit-type demonstration or show pictures and talk, or use any other method they like.
2. Assign partners. Have them choose or assign topics.
3. Distribute materials.
4. Help folks determine what are the important concepts to relate to the rest of the group and determine how to share that information.
5. Have everyone do their information sharing.

EXTENSIONS:

- Have groups call an expert. You can find out who they should call and provide a number or let them search out an expert. They should share the information with the rest of the group.
- Take a field trip to a local farm or a farmer's market and ask lots of questions!

You are the Expert

GOOD SOURCES OF INFORMATION ON GARDENING

Western Garden Book, by the editors of Sunset. Encyclopedia-style book that covers many aspects of gardening and answers basic questions. There are editions for all parts of the country. Often available used.

The Encyclopedia Of Organic Gardening, Rodale Press. This is a comprehensive guide formatted like an encyclopedia. Just look up whatever you are interested in, from a particular plant or insect to intensive gardening or compost. Often available at used bookstores.

Golden Gate Gardening, by Pam Pierce. This is a complete guide to year-round food gardening in the CA Bay and Coastal areas.

U.C. Ag and Natural Resources Catalog, available through the University of California Cooperative Extension office. Check the phone book for the office near you or phone within California (800) 994- 8849 or web site <http://anrcatalog.ucanr.edu>. This is a source to check for the following and more books on gardening.

The California Garden Web includes links to basic principles of home gardening, planning your vegetable garden, getting ready to plant, caring for, harvesting and storing your vegetables, as well as herbs. Cagardenweb.ucanr.edu/vegetables

3386 *Natural Enemies Handbook - The Illustrated Guide to Biological Pest Control*. \$45.00.

21385 *Wildlife Pest Control around Gardens & Home*, 122 pp \$18.00. Identification and control of pests, birds and mammals common in California.

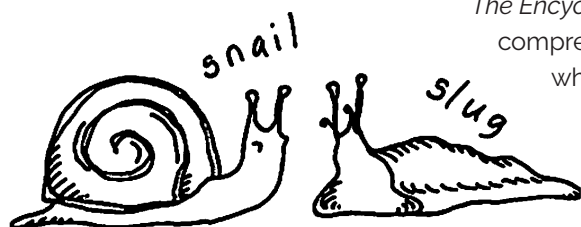
3332 *Pests of the Garden & Small Farm: A Grower's Guide to Using Less Pesticide*, 276 pp \$35.00. Practical, useful techniques to help the home gardener use less toxic pesticides, more biological controls, and other approaches to reduce pests.

8037 *Compost in a Hurry*, free to download.

8159 *Growing Tomatoes in the Home Garden*, free to download.

8059 *Vegetable Garden Basics*, free to download.

3382 *California Master Gardener Handbook*, 700pp \$37.00



Soil

2 GARDENING ACTIVITY

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.

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.

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.



Soil

TIME:

1-2 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+ participants trowels
- Access to areas to dig different types of soil (or you can provide pre-dug soil samples)

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.

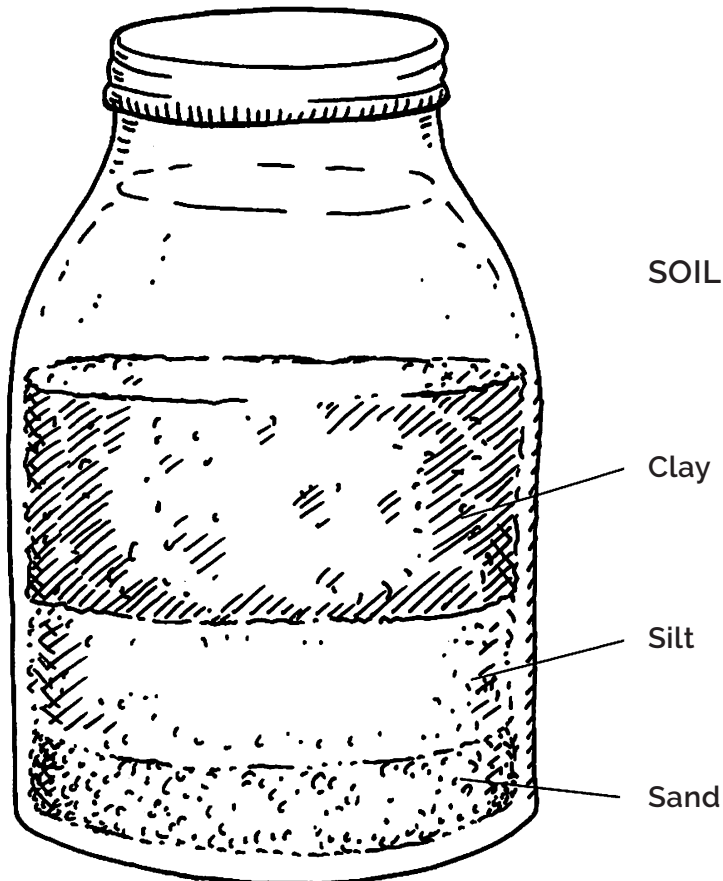
Part Two: Soil test

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.

Soil



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.

Design a Garden

GARDENING ACTIVITY **3**

Why Do This?

Planning together will make this garden belong to all the participants. When folks see their input in place they are going to continue their support for and involvement with their garden. When creating the garden design, the garden creators will learn from doing the mapping and research.

Summary:

This activity helps participants plan a garden. Everyone provides input and the group then decides what design will best meet the groups' needs. The plan is put on paper for all to see and review.

Some Helpful Information:

Gardening is up there with TV and Shopping as one of America's favorite pastimes. Some folks enjoy growing vegetables, some grow cactus, while others grow flowers. Some grow it all. There are all kinds of gardens. Successful ones are usually carefully planned. For your garden to be a success it will need lots of coordinated effort. This means everyone will take part. It works best if everyone is included in the planning. Here are some general rules for a successful garden;

1. Plant only as large a garden as can realistically be maintained. Beginners often over-plant and fail because their skill is not yet developed enough for the task. Develop an area you can patrol for weeds and pests and one you will have enough water for. If you want you can expand later!
2. Plan on paper before beginning.
3. Plant things that will fit the space you are working with. If long vinelike pumpkins are planted on the perimeter they can grow along the edge and not interfere with other plants in the center that are growing up rather than out.
4. Plant the right things at the right time of year. Peas don't like the heat and melons won't grow when it is cool. There are plants that are best suited to your area. They will be the most rewarding and easy to grow.
5. Sun, sun, sun! Plants need plenty of light to grow. If it is too shady you will be very limited in what you can grow. Pick a sunny location.
6. Soil, soil, soil! Without good soil it won't matter how much sun and water you have. Prepare the soil carefully and amend it as needed.
7. Water: make sure you have access and make sure if you plant seeds that someone will keep them moist. Depending on the weather, they should be watered once a day.



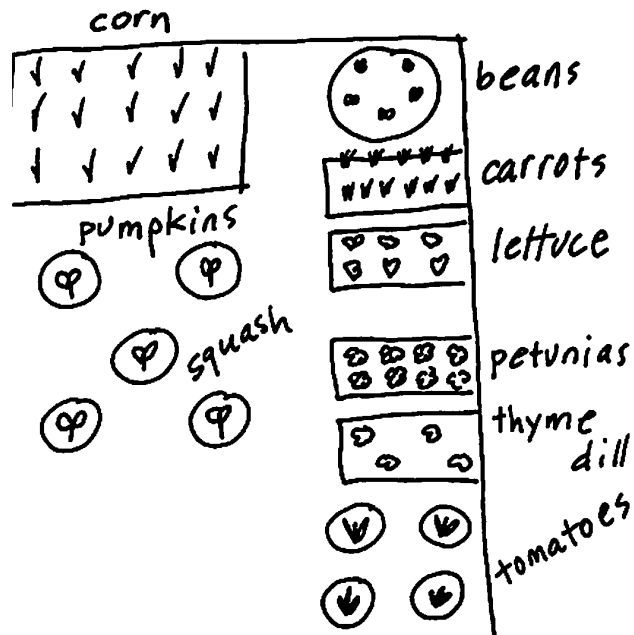
Design a Garden

TIME:

1 hour

PREPARATION:

1. Determine what sites and materials are available. See the background information. Consider raised beds or container gardens if your site prevents an in-ground garden. More information on these types of gardens is available in the books listed on page 14.
2. Gather some seed or garden catalogs and seed packets that illustrate garden produce and the needs of the plants.



MATERIALS:

- seed packets and catalogs
- rulers
- pencils and other drawing tools
- a magnetic compass
- large sheets of newsprint
- graph paper

STEP BY STEP:

1. Take a walk out to the future garden site and have a brainstorming and discussion session. Have everyone name their favorite plant, food or otherwise. Ask folks if they have ever grown things. What types of things would they like to grow?
2. Go to an area where people can draw and write in small groups. Break into groups of mixed ages, 4 or 5 persons per group. Provide drawing materials and graph paper to each group. Have everyone brainstorm the things they think the garden will need, like a faucet, sun and soil. List these things (on newsprint or a chalkboard) where everyone can see them.
3. Have each group come up with a garden plan that includes a list of 3 or 4 things they would like to grow. Each group can list and illustrate their plan on the paper you provide.
4. Have each group share their plan with the other groups. Note when there are similarities. You can keep a master list of plants and tally how many groups wanted similar plants.
5. As one big group, plan your garden. You can be sure to include the things most folks wanted and can combine the good ideas from the different groups.
6. Let everyone get in on drawing out the master plan for your garden. Older youth can mark off rows. Younger ones can draw in the plants and color the hoses and flowers!

Why Do This?

The nature of seeds becomes much clearer when you see the parts and understand their function first hand. The things plants need to grow are evident when you look at plants that try to do without.

Seed Magic

Summary:

This is a 2-part activity. Everyone will dissect a seed in order to observe seed parts in three seeds. Seeds will be planted with and without the conditions they need to see how they grow.

Some Helpful Information:

There are two basic types of plants and seeds, dicots and monocots. "Mono" means one; these plants start life with one leaf, like a grass. "Di" means two; these plants, like beans or radishes, start life with two leaves. Monocot and dicot seeds have three things in common: a seed coat, an embryo or baby plant, and a food supply. Cotyledons are the initial seed leaves of the plant. Monocots have one seed leaf and dicots have two. When mature, the leaves of monocots are long and thin (lilies and grasses like corn, wheat and rice); dicots' leaves are broad (almost all other plants). The seed coat is a protective layer that protects it until it is time for it to grow. (There are some lotus seeds that were over one thousand years old that grew and are growing today in Kenilworth Aquatic Gardens of Washington D.C.!) The food supply gives the tiny growing embryo enough food to sprout out of its seed coat and look for soil and water that will maintain the plant for the rest of its life. A food supply and water are what sprouts grow from when we make bean sprouts.

In the first part of this activity folks will look at seeds and see all the tiny parts that help them to grow. Everyone will draw a picture and label it to help them remember the seed parts.

All plants have the same requirements to grow into healthy plants. They all need air, water, nutrients the right amount of light and an optimal temperature. Different plants like differing amounts of water, different types of soil and grow in different temperature ranges. Broccoli grows well in cool temperatures but melons need heat. Strawberries like acidic soil; potatoes don't thrive in it. Too much heat and sunlight will make lettuce taste bitter and go to seed; tomato plants won't make tomatoes if they don't get enough light and warmth.

In the second part of this session we see how seeds will grow in varied situations. Some are started without water, others without soil and some without light. Have everyone make predictions about what will happen. Make notes and keep the notes with the plant to be amended over the next two weeks.



Seed Magic

TIME:

1 hour

MATERIALS:

- seeds, soaked overnight: kidney, pinto and/or green bean
- seeds, dry: peanuts in shell, radish
- crayons
- paper
- planting containers (four per group; cut-off milk cartons are fine)
- potting soil
- shoe boxes (one per group)

PREPARATION:

1. Gather materials
2. Review the activities to be clear on steps
3. Soak the seeds overnight

STEP BY STEP:

Activity One

1. Have a class discussion about seeds. Where do they come from? What do they look like? Why do they look that way? What will they become? What's inside?
2. Break into groups of three or so.
3. Distribute the soaked bean seeds and peanuts.
4. Tell everyone to open them up and see if they can find similarities and differences. Have them draw pictures, one of each kind, and label their drawings, naming the different parts (they are to decide what to call the parts).
5. Have everyone share their drawings and labels.
6. Show them the "Seed Magic" drawings. If they like they can copy down the labeled names. Their label names are fine too.

Activity Two

1. Discuss: What do seeds need to grow? What if they didn't have water? Soil? Light? It was very cold?
2. Explain that they are going to try growing plants with these varied conditions. Show them the directions and materials.

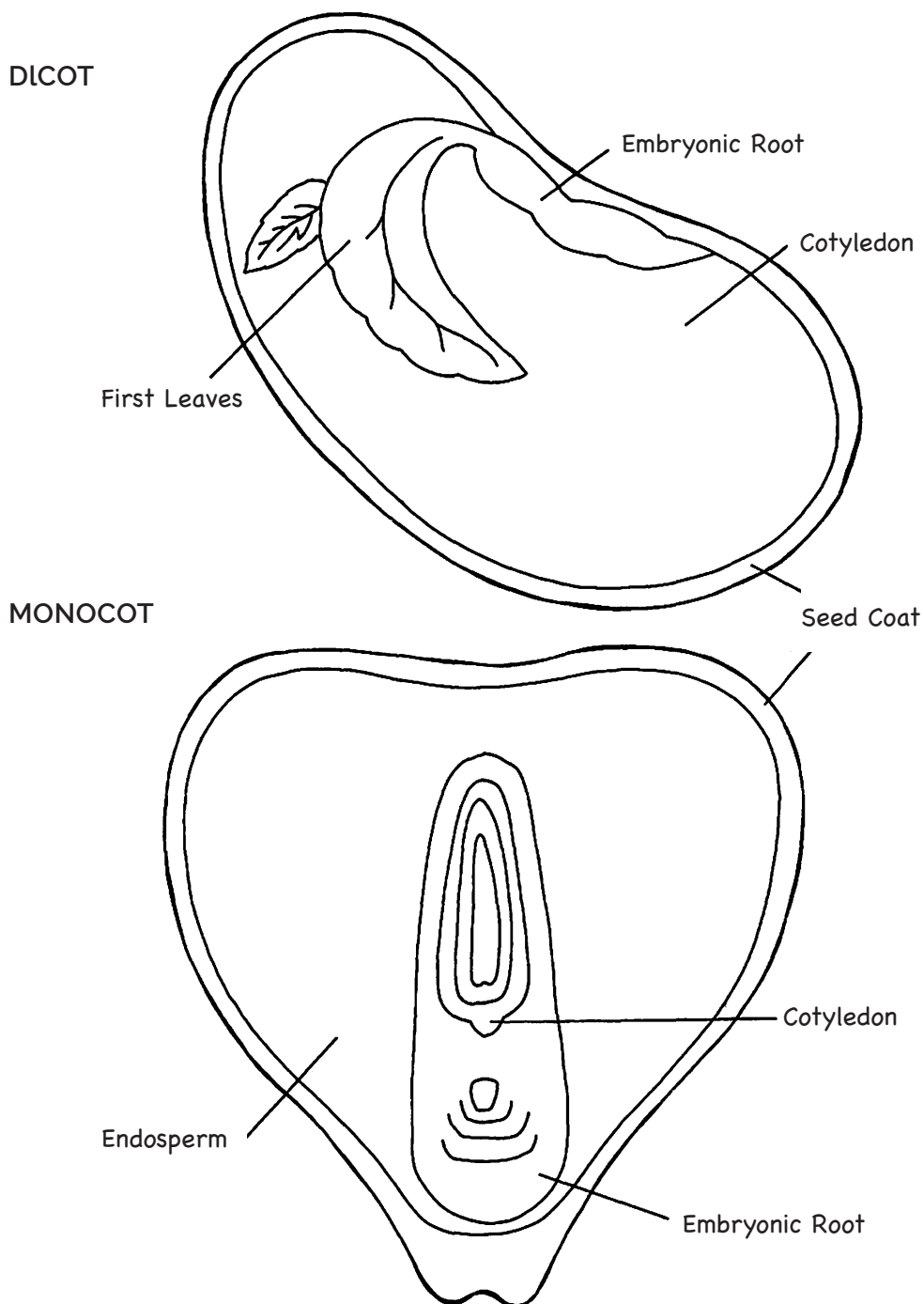
ALTERNATE PLAN: If you don't have enough materials for each group to do all four growth scenarios, you can assign one scenario to each group. At a later date have everyone compare results.

EXTENSIONS:

- Pack dry peas into a small container with water. Cover with a snap-on lid or a rubber band over plastic wrap. (They will swell up and pop off the lid.)
- Go outside and collect any seeds you can find. How do they travel? Stick to socks or pet fur? Flying in the breeze? Floating on water? In animals' or people's tummies? Have folks design a "traveling seed" on paper.

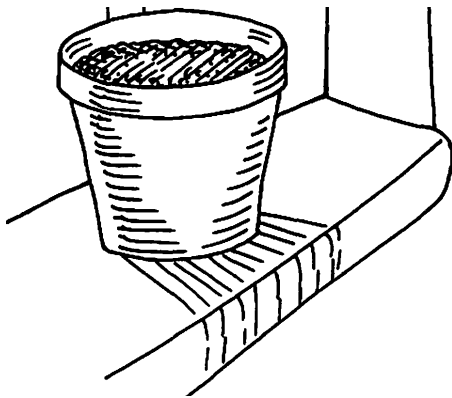
Seed Magic

Handout #1

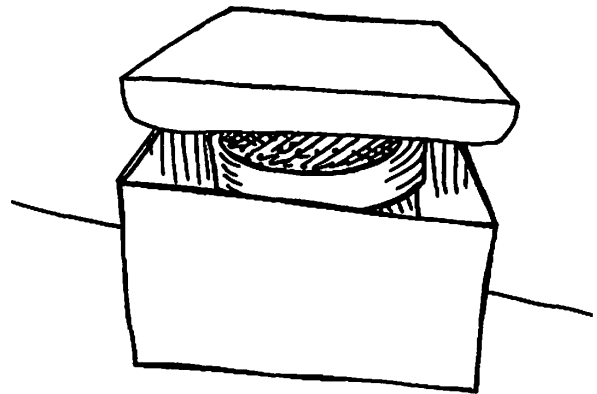


Seed Magic - Growing Seeds

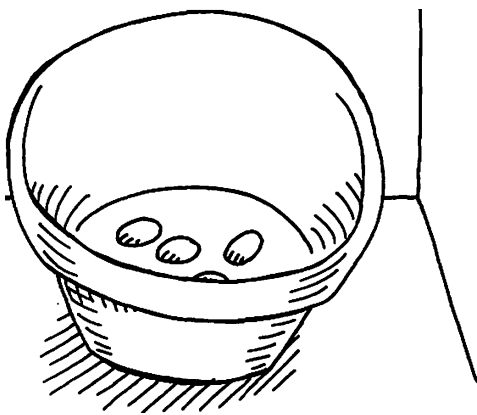
Handout #2



without WATER



without LIGHT



without SOIL



without WARMTH or LIGHT

CREDITS (ideas from) The Growing Classroom by Roberta Jaffe and Gary Appel, Addison Wesley 1990

Starting with Seeds

GARDENING ACTIVITY 5

Why Do This?

Seeds are the beginnings of most plants. These little miracles contain everything needed to start a new plant. Working with a variety of seeds helps us to understand how many seed types there are. Watching a seedling germinate further demonstrates the variety of seeds as well as demonstrating the miracle of seeds.

Summary:

Groups will explore different seed types, then construct a tiny greenhouse where they can observe several seeds germinating.

Some Helpful Information:

Seeds come in many shapes and sizes. Each type has its own characteristics of growth and dispersal mechanism. A tiny seed will travel better on the wind. A seed with a tough outer coat will make it through an animal's intestines intact. A pointy seed may work its way into the soil deeper than a rounder one. Big seeds are tougher. They aren't as dependent on perfect soil moisture conditions early in life as tiny seeds are.

Seeds look different as they germinate. Some seeds grow straight up out of the ground, while some push up a curved portion of stem that pushes through the soil before the leaves unfurl towards the sky.



Starting with Seeds

TIME:

1 hour

MATERIALS:

- Seeds - a variety such as corn, beans, sesame, sunflower, radish, peas, wheat, carrot, lettuce. (Read package carefully.)
- Sandwich size ziplock bags
- ¼ cup of potting soil per student
- ¼ cup measure (or three tablespoons)
- Popsicle sticks
- Construction paper
- Scissors
- 12" lengths of yarn or string
- Stapler
- Spray bottle of water
- Tape

PREPARATION:

1. Collect materials, snip yarn lengths.
2. Construct a ziplock greenhouse. See the illustration for directions.
3. Decide how you will distribute seeds so every group gets some of several types and one unique type that no other group has.
4. You may want to hand out everything except the soil and water. It helps with an active group to have one adult monitor the soil and one adult monitor the spray bottle(s).

5. **Optional:** You can cut out the construction paper greenhouse frames ahead of time. Then you will not need scissors for everyone.

STEP BY STEP:

1. Break into groups of 3-4.
2. Distribute a mixture of seeds to each group.
3. Tell all the groups they are to separate their seeds and categorize them. They can use color, shape, size, type or whatever classifications they choose. Let them know that their group has one unique seed that no one else has.
4. Have groups tell about their categories. After everyone has shared categories, they can then show which seed was the unique one that only their group had.
5. Show them the greenhouse baggie you made and explain how to make one.
6. Distribute materials and have everyone make their own greenhouse. Plant only two or three seeds per greenhouse; otherwise, they get too crowded, roots tangle and transplanting becomes too difficult.
7. The greenhouses can be taped up on a window low enough to see or be taken home to be put on a window and observed daily. When the plants get big they can be transplanted into pots or into outside garden areas. (If grown indoors too long they won't transplant well.) Refer to seed catalogs or pack ages for best time of year for planting outdoors.
8. Have everyone take a turn predicting what will happen. How long it will take? How will different seed look different as they grow? How might they look similar?

EXTENSIONS:

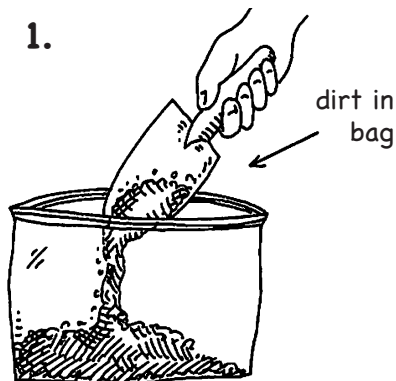
- Make notes of predictions and check them out with time.
- Cut open a green pepper and note all the seeds inside. Discuss why there are so many. What would happen if every pepper seed grew? Would the world be covered with peppers?
- Make art by gluing seeds to construction paper like a mosaic.
- Have everyone take an old sock and wear it outside their shoe. Walk through a meadow or weed patch. Water the sock and see what grows!

Starting with Seeds

CONSTRUCTING A ZIPLOCK GREENHOUSE

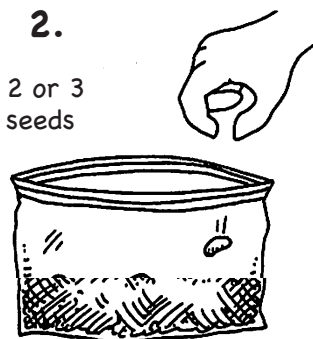
1. Put soil into ziplock bag.
2. Drop 2-3 seeds in, spaced apart.
3. Spray water into bag.
4. Close bag with air in it.
5. Create construction paper frame. Place popsicle stick and yarn at top edge; staple in place.
6. Fold paper house frame over bag.

1.



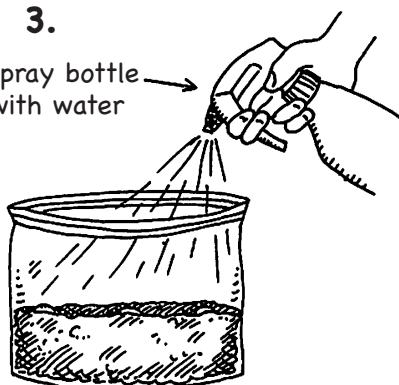
2.

2 or 3 seeds



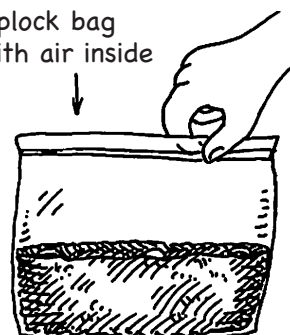
3.

spray bottle with water

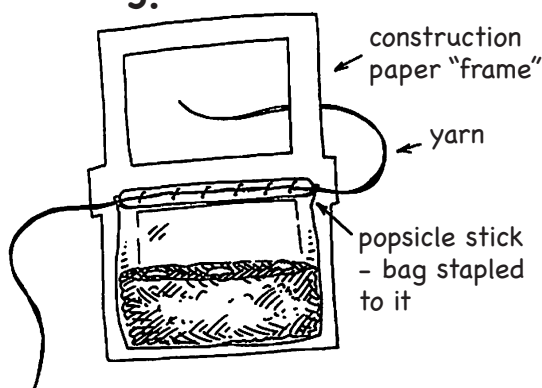


4.

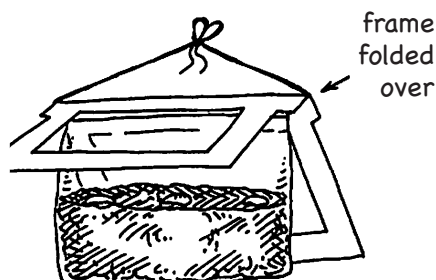
ziplock bag with air inside



5.



6.



Ready, Set, Grow!

6 GARDENING ACTIVITY

Summary:

Groups will sow seeds and plant transplants directly into garden.

Some Helpful Information:

Before planting anything, you need to prepare the soil and plan where to put things. Take into consideration which plants need lots of sun (melons, cucumbers ...) and which can use some shade (spinach, lettuce...). Consider planting things that need lots of water together (cucumbers, lettuce). Things that do better when not watered a lot (tomatoes) should be planted separately. Much of this is explored in the activity "Design a Garden" on page 18. When planning, decide which plants will be transplanted as seedlings (purchase or ask for donations from a nursery) and which will be directly sown into the garden as seeds. Spacing between rows and between plants depends on the plant variety. Referring to a good reference book and the seed package will provide this information.

Some plants are very tender when young. They will not grow well out in the garden until there is no chance of drying out or getting too cold. Some plants take quite awhile to grow to maturity. If they are started in a protected place, they can grow for awhile before the weather is nice enough for them to survive well out doors. This helps them get a headstart on the weather, and crops will be available sooner.

Seeds do best when planted just deep enough, but not too deep. The tiniest seeds often need just a sprinkling of dirt over them. Others need to be an inch underground so the roots are anchored solidly. All seedlings need to stay moist at first. Often seeds are planted close together. Later when plants are up and growing they can be thinned to an appropriate density. Plants that are left too close together will stunt each other.

Transplants (small plants put into the garden) need a good initial watering. They may droop a bit at first but will perk up in 24 hours or so. Dig a hole before removing seedling from the pot or flat. Don't let roots dry out or get hot. Remove them carefully; don't ever pull on the stem! Tear the small pot open or push up from below, keeping roots and soil as intact as possible. Plant the same depth as they were in their pot. Don't leave roots exposed or bury the stem. (Tomatoes are an exception. Some stem can be buried and roots will grow below the soil.) Some gardeners put a handful of fresh compost in the planting hole before putting in the plant to give extra nutrients.

Why Do This?

The entire group participates in the birth of a garden. They will see which plants start better as seedlings and how deeply particular seeds need to be planted. Everyone will nurture their own plants and learn from each other.



Ready, Set, Grow!

TIME:

1+ hours, usually in the spring.
Can be all year for different varieties
in a mild climate.

MATERIALS:

- Seeds
- Seedlings
- Rakes
- Hoes
- Trowels
- Shovels

PREPARATION:

1. Review the garden plan considerations. It is helpful to have a map of what will be planted where.
2. Gather seeds and seedlings appropriate for the season and your garden.
3. Collect other materials.

STEP BY STEP:

1. Have everyone agree on the planting plan and map.
2. Decide who will work together planting what.
3. Have the groups determine how deep and how close to plant.
4. Go plant!
5. Be sure everyone gathers at the end to show what they planted, how they did it and explain why.

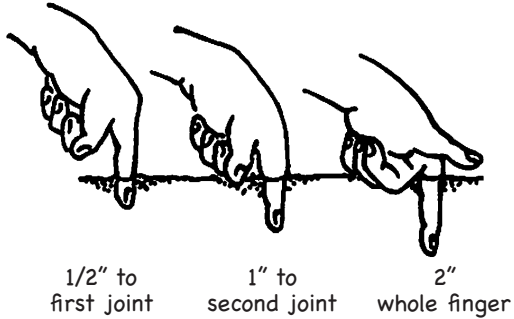
EXTENSIONS:

- Have the group start seedlings themselves for transplant.
- Try planting with different spacing to see results.
- Research wide row gardening, French intensive gardening, and any other gardening methods or theories. Try them out in different areas of your garden and compare results.

Ready, Set, Grow!

PLANTING:

poke a hole as deep as your seed needs



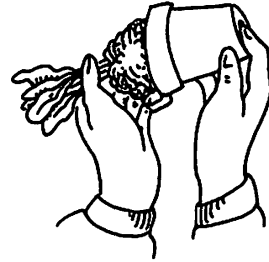
drop the seed in the hole



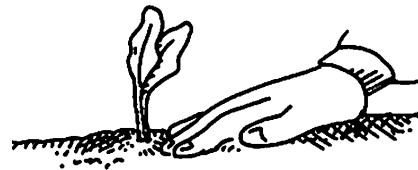
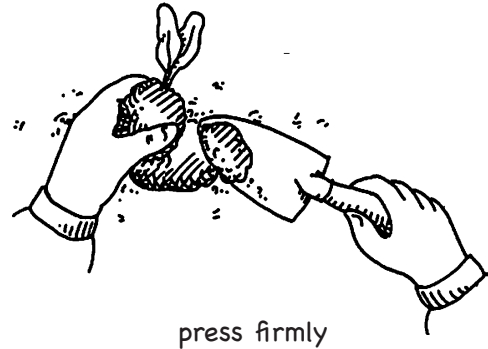
cover with soil and water well

TRANSPLANTING:

dig hole, then gently remove from pot



place in hole, add soil



water well



GARDENING ACTIVITY **7**

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.

Cool Tools

Summary:

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

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.)



Cool Tools

TIME:

1 hour

MATERIALS:

- Several of:
 - » Shovels
 - » Spading forks
 - » Trowels
 - » Cultivators
 - » Rakes
 - » Hoes
 - » Wheelbarrows
 - » Tool cleaning brushes
- 1 tool-cleaning tub
- Copies of the handout instructions

PREPARATION:

1. Make sure you have all the needed tools.
2. Make up a tool-cleaning tub, a large plastic tub filled with sand and vegetable oil (mix 5:1). Make it large enough so the shovel blade can be scooped into it.
3. Review all the rules and tools so you are sure of what the groups will be doing. Some rules and tools may not be necessary for your garden.

STEP BY STEP:

1. Take out the tools one by one. Name them and talk about how and when they are used. Demonstrate briefly each of the safety rules. Show everyone the cleaning tub and brush. Show them how to brush dirt off and put the tool in and out of the oily sand to clean it further. This applies a coating of oil that protects the metal from rusting.
2. Break into groups, one group per tool.
3. Distribute the tools and rule to each group.
4. Have the group make up a skit that shows the proper use of that tool.
5. Have each of the groups demonstrate while the rest of the groups try to guess what the rule is. Remember ALL these rules are followed with ALL the tools!
6. Remind everyone that if folks forget the rules while in the garden they must remind each other (nicely) to use the tools safely and follow the rules.

EXTENSIONS:

- Go to a hardware store together and look at all the tools.
- Have a race where someone tries to rake up weeds with a shovel while another person uses a rake, or fill a wheelbarrow using a hoe and a shovel. This shows the importance of using the right tool for the job.

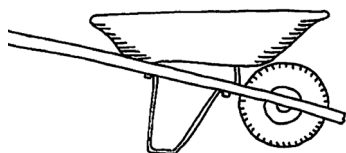
Cool Tools

TOOL RULES:

Wheelbarrow

Do a skit that shows how important this rule is:

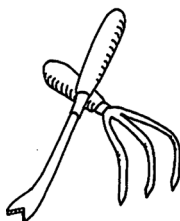
Walk when carrying tools or using the wheel barrow.



Cultivator

Do a skit that shows how important this rule is:

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



Hoe and rake

Do a skit that shows how important this rule is:

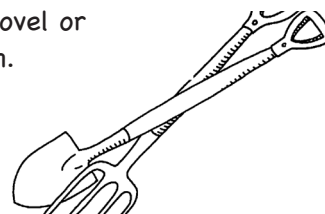
Tools on the ground should have blades and points facing down.



Shovels and digging forks

Do a skit that shows how important this rule is:

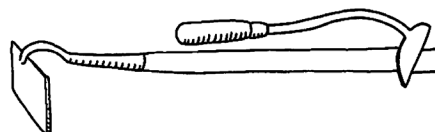
Use digging tools like a shovel or spading fork with shoes on.



Hoe

Do a skit that shows how important this rule is:

Keep them below shoulder level.



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

Do a skit that shows how important this rule is:

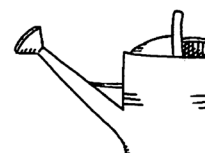
Clean tools before putting them away.



Hose/Watering Can

Do a skit that shows how important this rule is:

Make sure the hose is off so water is not wasted.
Coil hoses neatly out of the way.



Wet and Wonderful

8 GARDENING ACTIVITY

Summary:

Two demonstrations show that plants transport and transpire water. Three types of irrigation are then modeled for all to observe.

Some Helpful Information:

All parts of garden plants need water. Leaves of plants use water to make the sugar the entire plant needs to grow. Roots gather the water likewise for the entire plant. This means the leaves have something the roots need and the roots have something the leaves need. There are lots of tiny pipes that run up and down through the plant carrying water and nutrients to the places they are needed. The thick strings in a celery plant are examples of these kinds of waterpipes. They carry water up from the base of the plant to the leaves. If you supply these pipes with colored water you can see it move up into the celery leaves over time. Cut the celery and you will see the tiny tubes filled with colored water.

Plants need just enough water to grow well. Too much water in the soil keeps a plant from getting the oxygen it needs, but not enough lets it dry up. Either way, with too much or too little water, the plant may die. Roots absorb water from the soil. Large plants have deep roots, and smaller plants have roots closer to the soil surface. Deep-rooted plants need lots of water to penetrate the soil to reach the roots deep below. These plants do not need frequent watering, because deep down the water doesn't dry up quickly (if the soil type is loam or clay). Shallow rooted plants need watering more often to keep their roots moist and are prone to losing moisture to evaporation at the surface.

Garden plants can be watered using various methods. Furrow watering is seen often in big farms along the road. The farmer digs a long trench and mounds soil on either side of the trench. Water flows down the trench and the plants are planted in the mounds alongside. Drip irrigation supplies water very slowly in steady stream of drips in one spot. The water slowly seeps straight down. Overhead sprinkling is like rain: it wets the surface of the soil uniformly. Different plants benefit from these different types of irrigation. Sprinkling is great for seedlings that are not deep in the soil and need frequent watering. More water is lost due to evaporation if sprinklers are turned on during the day. When they get water on their leaves through overhead watering, some plants that are susceptible to mold and mildew diseases get damaged. Drip is used in mature deep-rooted plants that won't move for a long time, like grapes. Drip only waters at the roots of the desired plant. It conserves water and decreases weeds. Furrow watering keeps water off the plant leaves, preventing molds and mildews, and it doesn't require the expense of buying drip materials. When a large crop is only grown for a few months, then plowed under, it is too much work to set up drip equipment.

Why Do This?

Folks will pay much closer attention to how much they water and how they do it when they understand that it makes a difference to the plants.



Wet and Wonderful

TIME:

1+ hour(s)

MATERIALS:

- A plastic bag and twist tie or rubber band
- 2 cups of celery stalks with leaves and/or white carnations food coloring
- 3 groups, each with:
 - » glass bowl
 - » ½ cup fine grain soil
- 1 group with spray bottle
- 1 group with a juice can with small hole poked in bottom copies of irrigation method illustrations

PREPARATION:

1. One full day ahead place red or blue food coloring (15 drops) in a pitcher or jar of water. Under running water, cut off the bottom of the celery stalks (or carnation stems). Quickly place them in the colored water. Or, split carnation stems part way. Snip off the ends under running water and put one half in red water and the other in blue water (see illustration).
2. Make sure soil is fine grain. You can sift coarse soil through a ¼" screen or hand pick out any rocks and other large pieces.

3. Poke a tiny hole in the bottom of the juice can. (Put can over a broom handle and tap a small nail into the bottom.)
4. At the meeting site, several hours early (2 hrs on a sunny day, 4 hrs on a cloudy day): Stick a small branch with lots of leaves into the plastic bag and fasten it there with the rubber band or twist tie (see illustration). Make sure not to break the stem, and choose a stem that is low enough for all to get a close look at.

STEP BY STEP:

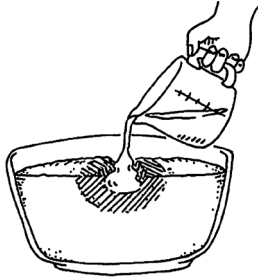
1. Break into three groups. Distribute the celery (or flowers). Tell group the plants didn't grow that way, and they weren't that way yesterday. Ask everyone to talk together to decide how they got their coloring.
2. Take everyone out to see the leaves you bagged earlier. Ask them what they see. How did the water get there? Where did it come from? (Don't forget to take the bag off!)
3. Now that everyone has seen that plants use water and transport it, we will look at ways to water our garden plants.
4. Separate into three groups. Each group is to try an irrigation technique in their glass bowl. Give them the handout with directions and other materials.
5. Have all the groups look at the alternative methods demonstrated by the other two groups.
6. As a large group decide which method is best for deep-rooted plants? For shallow-rooted plants? Which uses least water?

EXTENSIONS:

- Water three plants in different amounts and keep track of their growth (height, number of leaves) over several weeks.
- Keep track of how many weeds there are in the drip irrigated part of a garden compared to an overhead sprinkled area.
- Have folks sprinkle an area for 1 minute, another area for 5 minutes, and another for 30 minutes. Dig down and see how deep the water has gone in the different areas.
- Try putting different soil types (clay, sand, loam) in a colander lined with cheesecloth and compare how fast water moves through each.
- Carnation stem split part way with one half in red water and the other in blue water.

Wet and Wonderful

IRRIGATION METHODS:



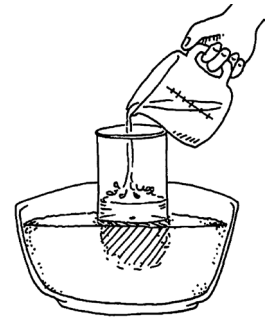
1. Furrow Watering

Fill bowl with soil and pack down. Make furrow. Water slowly with 1/2 cup of water. Note how water moves through soil.



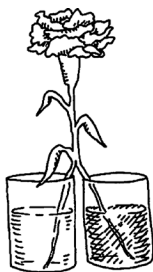
2. Spray Bottle Watering

Fill bowl with soil. Pack down. Using the spray can, water with 1/2 cup of water. Note how water moves through soil.



3. Drip Can Watering

Fill bowl with soil and pack down. Place can on soil near edge of bowl. Water slowly with 1/2 cup of water. Note how water moves through soil.



Carnation stem split part way with one half in red water and the other in blue water.



Small branch with leaves stuffed into a plastic bag and fastened there with a rubber band or twist tie. This branch is still attached to the plant!

Edible Flowers

GARDENING ACTIVITY 9

Why Do This?

Folks don't all have the experience of eating flowers. This activity will show them that some flowers taste good. They will have a planter to take home and show their families.

Summary:

Groups will get to sample some edible flowers and learn their names and growth habits. Everyone gets to plant a container with edible flowers to take home.

Some Helpful Information:

There are lots of edible flowers. Their flavors vary from subtle (some say flavorless) to spicy hot. Some of the edible flowers are from herbs, and others are flowers we usually think of as just ornamental. Adding flowers to salads livens up a dish for people and may make it more appetizing.

IMPORTANT:

- Do not eat flowers unless you know they have not been sprayed with dangerous pesticides or other chemicals. There are some dangerous substances used to treat plants such as roses in an ornamental garden.
- Do not eat any plants or flowers that have not been identified to you as edible and safe to eat.



Edible Flowers

TIME:

1+ hour

MATERIALS:

- Common edible plants
 - » Johnny-jump-ups, four seedlings per person
 - » Calendula, one seedling per person
 - » Forget-me-not, one seedling per person
 - » There are many different edible plants listed on the handout to choose from
- 8" pots, one per person
- Potting soil
- Mixture of edible flowers or prepared stuffed nasturtiums (see recipe on the handout)

PREPARATION:

1. Collect materials. Nurseries sometimes have old pots that they can give/ donate or sell inexpensively. Larger pots are better, the plants roots will have more room and grow stronger and longer in a large pot. If you get larger pots get a few extra plants to fill them in.
2. Buy seedlings without flowers! Seedlings that are flowering already are stressed. A healthy plant for transplanting has not already out grown its container.
3. See if anyone you know has nasturtiums, roses, lemon blossoms, or other flowers you can bring in for folks to taste. Fancy grocery stores and farmer's markets are good places to look for edible flower mixes.

STEP BY STEP:

1. Serve the flowers or stuffed nasturtiums you have brought.
2. Have a discussion, has anyone ever eaten flowers before?
3. Distribute materials and have everyone make up a flower pot to take home.

EXTENSIONS:

- Be sure to plant some edible flowers in the group's garden.
- Check out the book *Living With The Flowers* by Denise Diamond. Prepare some of the recipes with your home grown flowers.

Edible Flowers

Here is a list of flowers to eat that you can choose from to grow in your garden:

Savory Herbs:

These are strong, use in small quantities

- basil
- bee balm chamomile chives
- dill
- garlic chives lavender lemon verbena mustard (hot) nasturtium oregano



Sweetly Floral:

adds a perfume-like sweetness; let some soak in a glass of water and enjoy.

- apple blossom carnation or pink (small varieties, not hothouse ones) day lily
- geranium (pelargonium) honeysuckle
- lemon blossom lilac
- orange blossom petunia
- plum blossom rose
- violet

Mild Herbs:

More a sweet than pungent flavor, some slightly bitter

- borage
- calendula
- chicory clover
- red dandelion
- elder flower
- hibiscus
- passionflower
- salad burnet
- yarrow

Mild Floral:

subtle and delicately sweet; add for color and faint flavors

- gladiolus
- hollyhock
- johnny jump up
- pansy
- peony
- poppy (petals only)
- primrose
- sunflower
- squash blossom
- tulip
- viola

Edible Flowers

Stuffed Nasturtiums

(Serves 6-8)

Ingredients:

½ cup ricotta

¼ cup finely chopped walnuts

1 tablespoon cinnamon

Directions:

1. Mix ingredients together and roll into small balls.
2. Place balls inside nasturtium flowers, top with a Johnny-Jump-up.

Here are some alternate designs to choose from for the take-home flower pots:

- 4 Johnny Jump-ups around edges, 1 calendula and 1 Forget-Me-Not in the center
- 3 purple petunias on boarder, 3 multicolored giant pansies in-between with one scented geranium center.
- 6 apricot and yellow violas planted all around 3 Iceland Poppies.



Why Do This?

Compost is a natural way to add nutrients and conditioners to the garden soil. Learning about compost teaches about how nature recycles living things through the soil into living things again.

Compost

Summary:

Groups will work together to build a compost heap. Over subsequent weeks the entire group will monitor the pile's progress.

Some Helpful Information:

Just think what the world would be like if plants and animals didn't break down and decay. YUCK! We would be stepping over dead everything, all the time! A compost pile is a place where we help out the decomposition of garden and kitchen waste.

With the right ingredients a compost pile can produce all the soil amendments your garden will ever need. There are lots of ways to compost. You can just heap up anything that used to be alive and let it sit; in a year or so it'll become rich soil full of nutrients. You can chop up all the waste, pile it in layers, keep it watered and turned and you will have rich compost in a few weeks.

Anything that used to be alive can decompose in a compost pile. Even an old pair of cotton socks will decompose into soil. Most people choose to put things in their pile that will decompose rapidly and also things that won't attract critters like flies or dogs. For this reason you probably won't be throwing in any socks or meat products. Earthworms and sow bugs will help your compost and garden. They are decomposers; they eat and digest as well as burrow, aerate, and mix efficiently.

A well-nourished compost pile will supply good quality fertilizer and conditioner for the garden. Compost that is fed only a limited diet will break down very slowly and contain a limited number of nutrients. The results of your soil test (from Gardening Activity #2) can help you understand what your garden's soil may be lacking or already have enough of. Check soil acidity before adding lots of ash. Whatever your soil type, any garden can benefit from the nutrients and conditioning gained by adding compost. Conditioning means to add "roughage" to your soil. Partially decomposed material fluffs up soil, helps aerate it and can increase drainage in clay soils and water retention in sandy soils. Sound like the garden soil cure-all? It is!

There are commercially available fertilizers that can be purchased and added to the soil. These materials are expensive, can be toxic and do not add any conditioning to the soil. Composting provides a lesson in basic biology (decomposition) and encourages folks to recycle at the same time. Compostable materials are available free for the hauling. You need to chop them up if you want them to compost quickly. If you have time to wait, just toss 'em in whole.



Compost

TIME:

1+ hour(s)

MATERIALS:

- Composting materials from homes and around the community
- Shovels and spading forks
- Water
- Soil
- Thermometer
- Wheel barrow

PREPARATION:

1. Have everyone save all non-meat and dairy kitchen scraps from the week before.
2. Select a permanent compost pile spot in the garden area. Remember you'll want to be able to drop manure off, as well as get finished compost to garden. You'll need access to water as well.
3. Obtain material for composting.

LOTS OF: leaves, lawn trimmings straw or hay (from the floor of a feed store) wood shavings weeds (avoid those that have gone to seed)

SOME: manure (from horse, dairy, goat, rabbit, or chicken farm) kitchen waste (fruit, veggies of all kinds, any former plant material)

A BIT OF: wood ash earth worms (optional) garden soil

4. Decide if you want to build a structure for your pile or just make a heap. If you are going to build a structure look up composting at the library or call the local Cooperative Extension office to see the various designs possible.

STEP BY STEP:

1. Talk about composting with group. Ask what will become of an apple core left in the dirt? What happens to dead leaves, animals and such in the forest? Why don't forest plants need to be fertilized?
2. Talk about how plants have different nutritional needs like people. Show them the different things gathered to be composted.
3. Divide into four groups. One group will add lots of plant materials, the next group will layer on some manure, the next group sprinkles with topsoil. Someone sprinkles the layers with water. Repeat the layering until you use up all the ingredients. Group members take turns filling a wheelbarrow, shoveling, spreading things on the pile.
4. Everyone together covers the heap with straw or soil.
5. Place thermometer into the heap and note the temperature.
6. Be sure to take the heap's temperature weekly at least. When it begins to cool it's time to turn it.

EXTENSIONS:

- Make a terrarium with soil in the bottom. Toss in food scraps, paper, plastic, anything. Keep it moist and see what decomposes and what doesn't.
- Make mini composting containers from milk cartons. Have everyone layer in composting ingredients and watch the decomposition occur on a small scale. Plant some seedlings in the resulting compost.
- Go to a weedy or forested area, dig up some soil and look at what is decomposing, look for fungus and insects that help decomposition happen. Compare an area where plants look healthy and another where they look weak.

Compost

Here are the nutrients you can get from various compostable materials (Don't forget kitchen scraps they are always good for the compost pile);



Nitrogen:

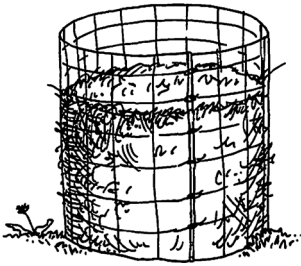
- manure (bird is best, then horse, then cow) grass clippings
- leaves (especially oak) alfalfa hay

Phosphorus:

- manure (bird is best, then horse, then cow)
- wood ashes
- wool waste
- hair (from a beauty parlor)

Potassium:

- wood ashes kelp
- alfalfa hay



Trace minerals:

- just about everything you add will provide some (food scraps – non-meat and non-dairy)
- wood ashes
- leaves

To build a classic compost heap the ingredients are layered into a pile that is then covered over with soil or straw (see illustration). An easy way to compost is to make a cylinder of wire and just toss everything in as you collect it. It's nice to have a pile of leaves or sawdust nearby to sprinkle over the top so you don't have to look at yesterday's leftovers. All compost piles need water, as wet as a rung out sponge is the moisture level you try for. They will decompose quickly if you chop all the ingredients, keep them moist, stir them once a month or so, mound them back up and cover them. As time progresses deep dark rich compost soil will appear ready to be spread on the garden.

This is a brief overview of an interesting topic. Composting is a great gardening activity. There is a lot of information about composting if you check with your U.C. Cooperative Extension office-check this web site, <http://anrcatalog.ucdavis.edu> to download publication 8037, "Compost in a Hurry." Check with a local garden club, nursery or look in the library. Do some research and you can learn a lot more about composting.

Rotation

11 GARDENING ACTIVITY

Summary:

This activity simulates plants growing, using nutrients and the benefits of crop rotation.

Some Helpful Information:

Some plants feed on the nutrients in soil more heavily than others. Specific nutrients are depleted from the soil if the same crop is planted in the same soil year after year. Other plants can actually help increase the fertility of the soil. If plants that contribute nutrients are planted some years they can help the soil rejuvenate itself.

It is wise to give an area of soil a break from growing crops at all. It's even better for the soil to plant what is called a "green manure." Examples of green manure are rye grass or leguminous plants (plants whose seeds grow in a pod with two seams like all peas and beans) like vetch, soybeans, or red clover. These plants, with the help of tiny soil bacteria, are able to collect nitrogen gas from the air for plant growth. Once grown the green manure crop is then turned into the soil. This adds a lot of soil conditioning roughage to the soil as well as nitrogen. These plants also can make phosphorus more available to whatever is planted in the area next.

A common crop rotation scheme is to plant a heavy feeding crop like corn, cabbage family vegetables or tomatoes in a spot one year then the next year plant a soil enriching crop like the legumes: fava beans, peas or beans. The enriching crop is turned into the soil after harvest. The next year light feeding plants like root vegetables, bulbs and herbs are planted. This three-year cycle is then repeated.

Rotating crops like this helps to control pests as well. Many insect larvae winter in the soil. If they hatch the next year and the plant they like to feed on is gone they will not survive as well. For similar reasons, rotation helps control plant diseases.

Why Do This?

This will give participants a visual understanding of crop rotation.



Rotation

TIME:

1 hour

MATERIALS:

- 100 2" X 2" paper squares
- An open area about 10' X 10' to play "Crop Rotation" in.

PREPARATION:

This game requires everyone's attention. Review the steps so you can keep track of the game and all the players at the same time.

EXTENSIONS:

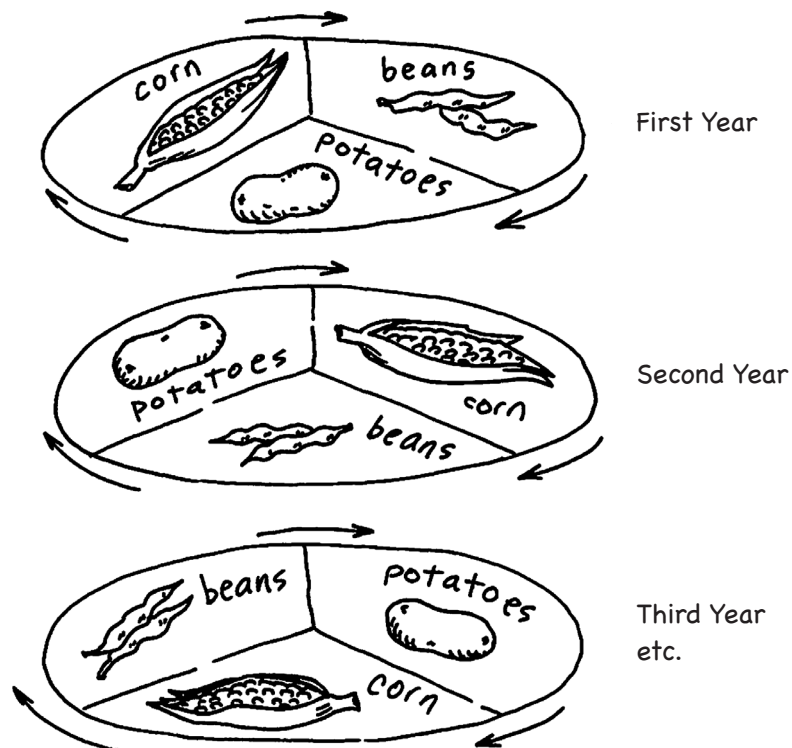
- Apply crop rotation plans in the group's garden.
- Drop some specially marked paper squares in the potato patch. After the next round show that any potato that collects the marked squares had inadvertently picked up a potato disease. (If crops are rotated the disease is dispersed by corn and beans, but the soil is clean again when the potatoes get there!)
- In the garden try different legumes and green manure crops in different areas of the garden. Compare how well the next year's crops grow.

STEP BY STEP:

1. Planting:
 - Get three volunteers to be corn plants. To "plant" them in the corn patch, have them all stand in a small area about 2 feet apart.
 - Now you need three people to be bean plants. Plant the beans in a spot next to the corn.
 - Last to be planted in this simulated garden are potatoes. Have three members volunteer to be the potatoes. Plant them adjacent to the other two crops of corn and beans.
2. Scatter about $\frac{1}{3}$ of the paper scraps evenly over the floor/ground around the plant/people. Explain that these represent the soil nutrients the plants need to grow and produce their vegetables. Remember, plants cannot move! They can bend down and use their fingers like roots, but their feet must stay stationary or they are out of the game.
3. When you signal the plants to "GO" they are to scoop up all the nutrients (paper squares) they can and then stop when you signal (by saying stop or blowing a whistle, or ringing a bell ...). Play for 15 seconds or until most of the papers squares are picked up.
4. After stopping explain that the beans actually put nutrients back into the ground. They are to drop all their paper pieces. Give each bean three more pieces that they again drop onto the ground. The potatoes are light feeders. They only need 3 pieces of paper. If they have 3, they produced a beautiful crop of spuds this year. If they have any extras they should drop them back on the ground. The corn is a heavy feeder. Each corn plant must have 7 squares of paper, or they didn't produce very well.
5. The season is over and these plants are harvested (have the people step aside.) A new crop is planted. Get volunteers for each crop and plant them in the same places. You fertilize with a bit of compost by sprinkling more paper squares EVENLY through all the growing areas. (There will be squares building up in the bean patch, a few extras in the potato patch, and very few left in the corn patch.)
6. Repeat steps 3, 5 and 6.
7. Have a discussion. What can the gardener do to make sure the corn gets enough nutrients? How about if we plant the beans where the corn was, put corn where the potatoes were, and plant potatoes where the beans were? Next year the same rotation can be done. Nutrients will begin to even out in the garden this way.
8. Let members suggest rotations and try them out. Keep playing until it seems they can grow successive crops and maintain soil fertility enough for successful crops.

Rotation

CORN | BEAN | POTATO ROTATION:



Why Do This?

As the group becomes familiar with gardening they can learn some interesting specifics that will help produce healthy crops.

Companions

Summary:

Groups will learn about companion planting by doing a role play. They will try planting companions together and watch to see if these plants benefit from each other as the garden grows.

Some Helpful Information:

Plants have their likes and dislikes. Some plants benefit from being planted next to each other. Natives of Mexico have practiced companion planting for centuries. Corn plants are planted with a bean plant at their base. The bean plant adds nitrogen to the soil (if turned in to the soil), which helps the corn grow. The corn plant gives the bean something to hold onto as it grows tall. This helps the bean. Planting squash around the beans and corn provides a ground cover that prevents weeds from growing up, and the squash doesn't mind a little shade from the other plants in the hot afternoon sun.

There are also plants that attract good insects that feast on garden pests. You can plant them on the edge of vegetable plots or in flower borders. The more variety you plant, the more beneficial insects you attract. Some of them are alyssum, coriander, cosmos, fennel, California Lilac and buckwheat.

Some plants don't do well when planted with each other. The handout lists many common garden vegetables, what plants to plant near them, and which not to plant with them.



Companions

TIME:

1 hour

MATERIALS:

- Copies of "Companion Planting Guide"
- Picture of Pole Bean, Corn and Squash
- Some companion plants or seeds (see preparation)

PREPARATION:

1. Depending on what is in your garden, select some seeds/seedlings to plant as companions (refer to the handout information.) You will give some seeds or seedlings to each group. They will use the handout, "The Guide To Companion Planting," to decide where in the garden to plant the vegetable, herb or flower you provided for them.
2. Review the role play so it will be easy to narrate and direct.

STEP BY STEP:

Do a role play with the group. Volunteer group members take the roles of different plants as the leader narrates the story to everyone.

1. Volunteers play three corn plants, standing tall with arms up.
 - Some more volunteers (5-6) become invading weeds. Some grow up tall and some spread out across the ground, all crowding around the corn plants. These weeds take up nutrients and space.
 - How do those corn plants feel? This weedy garden stands while another is created.
2. Three more corn plants stand up.
 - Now three volunteers become bean plants growing at their base. Bean plants add nitrogen to the soil that the corn uses to grow. They pretend they are feeding snacks to the corn.
 - There is still room for weeds though so now a couple of sprawling squash are planted at the base of the corn. They shade the ground preventing weeds from growing and languishing in the shade of the corn and beans.
 - How do these corn plants feel?
3. Have a discussion of companion planting. Explain that some plants grow well next to some and not very well next to others. Companion planting is planting plants next to each other that help each other out.
4. Break into groups. Give each group a seed package or seedlings and a "Guide to Companion Planting." Have the group decide where to plant their seeds/seedlings and then do the planting.

EXTENSIONS:

- Write down the differences you notice as companioned plants grow next to ones without companions.
- Find a book on companion planting and learn about the various herbs that are great for companion planting.

Companions

THE GUIDE TO COMPANION PLANTING

Vegetable	Plant with	Don't Plant with
Beans	potatoes, carrots, cucumbers, cauliflower, cabbage, summer savory, most herbs and veggies	onion, garlic, gladiolas
Beans (pole)	com, summer savory	onions, beets, kohlrabi, sunflower
Beets	onions, kohlrabi	pole beans
Cabbage Family (cabbage, Cauliflower, kale, kohlrabi, broccoli)	potatoes, celery, dill beets, onions, lavender	strawberries, pole beans, tomatoes
Carrots	peas, leaf lettuce, chives, onions, leek tomatoes	dill
Corn	potatoes, peas, beans, squash	
Cucumbers	beans, corn, peas, radish, sunflowers	potatoes, aromatic herbs
Eggplant	beans	
Leek	onions, carrots, celery	
Lettuce	carrots, radish, strawberries (mix seeds and grow all at once) cucumbers	
Onion/Garlic	beets, strawberries, tomato, lettuce, savory, beans	peas
Peas	carrots, turnips, radishes, cucumbers, corn, beans most herbs and veggies	onions, garlic, potatoes
Potato	beans, corn, cabbage, marigold, horseradish (plant at patch corners)	squash, cucumber, sunflower, tomato, raspberry
Radish	peas, nasturtium, lettuce cucumbers	
Spinach	strawberries	
Squash (pumpkins)	nasturtium, corn	
Strawberry	bush beans	
Sunflower	cucumbers	
Tomatoes	chives, onion, parsley, nasturtiums, carrots, limas, marigold	kohlrabi, potato, cabbage, fennel
Turnip	peas	

Adapted from The Growing Classroom, Addison Wesley, 1990

Pest or Pal?

13 GARDENING ACTIVITY

Summary:

Some local insects and tiny garden creatures will be gathered. Using the material provided the critters will be identified. Pests will be moved elsewhere and pals will be returned to the garden.

Some Helpful Information:

Scientists tell us that in a three foot square area of healthy soil there are as many as 2,000 insects, many too small for us to see without a microscope.

All insects, worms, spiders, lizards, frogs, birds, toads and other creatures have their own useful place in nature. Each plays a role in the delicate balance, eating others and serving as food for another. Some of the small animals that get into your garden will help control the other pests that might damage your crops. Whether we label them pests or pals, all of these critters are just trying to make a living, they really mean no harm. Most of the common garden invaders are covered in the handout notes included with this activity. There are lots of animals you may find in your garden that are not covered here. The gardening section and insect section at the library have many books that can help you find out what an insect is and if it is a friend or foe of your garden. Read through the critter information provided here for an interesting look at some common garden denizen.

People are finding that insects become resistant to insecticides, the sprays are costly and can be very toxic to humans and other animals. Integrated Pest Management (IPM), using cultural or biological methods as much as possible to control pests on plants, is a rapidly growing field. IPM has some advantages over using chemical sprays alone. Using these methods to control pests is much safer for the gardener and the consumer of the treated products.

Why Do This?

There are all sorts of critters that take up residence in a garden. With first hand experience looking for them, identifying them and learning how to deal with pests everyone will learn a valuable gardening skill.



Pest or Pal?

TIME:

1+ hour

MATERIALS:

- Small clear containers (baby food jars work well, bug boxes are great if you can afford a lot of them)
- Hand lenses, available at nature stores
- Copies of "Pest or Pal?" handout
- Some gardening books on natural pest control (from the library)
- spray bottle
- 2 cloves of garlic
- A hot pepper newspaper or short sections of old hose jar lids and an inexpensive beer
- 1 tablespoon liquid SOAP (not detergent)

PREPARATION:

1. Collect materials. If you know people who use baby food, have them save jars for you.
2. Read the handout information on garden critters so you are familiar with the material.
3. Refer to the herbs activity (Garden Activity #15) to see what herbs are good to repel and deter insects.
4. Make some natural pest control products. (See the pest control part of the handout on page 53)

STEP BY STEP:

1. Have everyone scour the garden or any outside area and bring back a sampling of the kinds of tiny animals that live there. They can also bring back leaves that have been munched to see if they can discover who is causing the damage. Make sure everyone knows to be gentle, for these animals are alive and deserve to be treated with respect! Replace any moved rocks or boards; we wouldn't like it if a giant ripped the top off our house to peek in then walked off and left us roofless! Find as many different types of garden critters as possible and bring back samples in jars, remembering where they came from. Some animals need a damp environment and should not be put back in dry places, etc.
2. Set the jars out and have everyone look at what was found. If anyone knows the name and/or habits of a certain type of animal, have that information shared with everyone.
3. Divide into groups and distribute the jars evenly amongst the groups. The groups are to look at the information sheets and try to decide if the animal should be released back into the garden or taken to another location and released.
4. Show everyone the samples of pest controlling materials and talk about the other ideas provided for pest control.
5. Take all unwanted critters to an area away from the garden and the gardens of others and release them. Remember that snails need damp shade to survive. A dry dirt field would kill them!

EXTENSIONS:

- Have weekly forays in the garden to see if populations rise, fall, move or change with the seasons and the groups efforts to control them.
- Have folks devise bug catching devices that will work at night when the bugs are out. (Several are illustrated in *The Organic Gardener* by Catherine Osgood Foster)

Pest or Pal?

SOME COMMON GARDEN VISITORS “PESKY FELLOWS”

Slugs and Snails eat just about everything. They like cool damp times and often come out only in a drizzle or at night.

Earwigs eat the tiny first plant growth often leaving just a tiny green stub where a sprout once was. They eat just about any newly sprouted plant but particularly love marigolds, beans and zinnias.

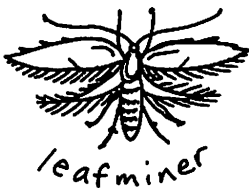
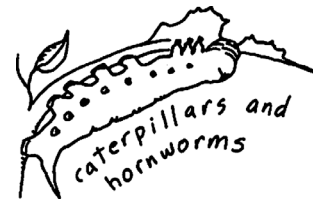


Aphids and Whiteflies suck plant juices and kill the plant by eating its juices or letting infection kill a weakened plant. Aphids will sometimes farm aphids like they were dairy farmers. The aphid produces a sweet nectar that the ant eats. Ants will actually carry aphids from place to place spreading aphids on your plants! Both of these pests can be hosed off plants fairly effectively. Remove infested plants and control ants. Try some peppermint!



Cutworms chew through the stem of a plant at ground level causing it to topple over. Make a little wall or collar for the plant by setting a milk carton or plastic soda bottle with the ends cut off over the plant.

Caterpillars and hornworms (cabbage loopers) crawl on leaves munching as they go. The plants can lose all or at least a lot of their leaves! These can be picked off by hand or there are organic sprays (of a bacteria that attacks caterpillars) that can be purchased.



Leafminers are little flies that have larvae that burrow between the layers of the leaf, leaving sinuous trails. They are particularly fond of spinach, chard, beets, and squash. The eggs are easy to see and can be rubbed off the backs of leaves. On squash they can be left. Growing the other plants in cooler times of year makes the leaf miner less of a problem.

(continued)

Pest or Pal?

Handout, *continued*

"VERY HELPFUL HALF-PINTS"



Honeybees help pollinate plants, ensuring better crops. Plant bright flowers to attract them to your garden. Consider becoming a beekeeper and you can get some honey from them as well!



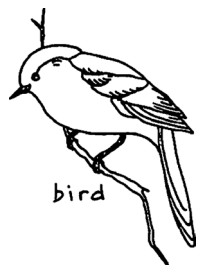
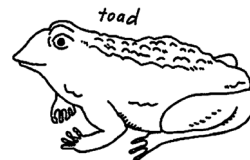
Lacewings are pretty flying insects that have clear wings with lots of visible veining. Their larvae eat lots of aphids and whiteflies for you.

Lady bugs and their larvae both eat voraciously on aphids and other insect pests. These pretty spotted insects can eat a lot and are always welcome in the garden.



Spiders are arachnoids (no – they are not insects, they have 8 legs, insects have 6). Spiders do a lot of insect catching for you. Black widows and brown recluse spiders can hurt you, so treat them with respect and let them be!

Toads and **lizards** eat insects. (Toads can eat hordes of ear wigs.) Toads like a cool dark place to spend hot dry afternoons. Placing a clay pipe in a shady place can provide a great toad home.



Birds can eat a lot of insects. Some birds peck at freshly planted seed and at fruit, so you may want to only provide nests for the kinds that eat insects like martins and swallows. You can net seeds and fruits to protect them from birds.

Herbs and decoy plants: Some herbs can help repel insects from the garden. There are weeds that insects like to munch that can keep them occupied on

something other than your garden plants.



You and I with a watchful eye: If we look closely at plants regularly we will be able to tell if there is an insect problem before it gets out of control. We can pick off unwanted pests and thank the helpful fellows when we see them at work in our garden.

continued

Pest or Pal?

Handout, *continued*

NATURAL PEST CONTROL, TRICKS AND TRAPS!

- Hand picking insects and other pests off plants is often the easiest and best defense. If you don't like to touch them, a pair of rubber gloves are inexpensive at the hardware store.
- Plant a little extra for the bugs so they can share your bounty!
- A soapy water solution: 1 tablespoon of liquid dishwashing SOAP (not detergent) in 1 quart of water. Put in a spray bottle. Good for aphids and whiteflies. Rinse plant after it has set for an hour or more.
- Use a blender to prepare a mixture of 1 hot pepper, 2 cloves of garlic and 4 cups of water. This can be strained and sprayed on infested plants. It won't hurt the plant and will rinse off food before eating.
- A jar lid, saucer or other shallow container settled into the soil then filled with beer will attract and drown many pests, especially earwigs and slugs.
- A short section of old hose or a rolled up newspaper will attract nighttime marauders like earwigs.
- These can be collected and moved well away from the garden in the morning.
- A board laid on the soil with a little bit of crawl space is good for collecting snails and slugs. In the morning they can be gathered and carried far from the vegetable garden and released.
- Birds eat a lot of insects. Providing a bird bath may attract them. A bird house or two (placed where cats can't bother them) will encourage birds to stay and pick off insects for you.
- Lizards, frogs and toads are also great insect catchers. Make them feel welcome. If they have a favorite place in a pile of pots, on a pile of rocks, or in a water trough, let them claim it as home and don't disturb them.
- There are flowering plants called insectaries which attract beneficial insects to your garden. Ask your group leader where you can learn about these. Plant some!
- Nurseries sell ladybugs and sometimes praying mantis egg cases. These beneficial insects can be released into the garden to help control less welcome insects. It is fun and educational to see these insects, but be warned (before spending a lot of money on them) sometimes they just leave!

Worms

GARDENING ACTIVITY 14

Why Do This?

Worms are great garden helpers. Members will come to appreciate how they help the garden and soil by observing their behavior.

Summary:

Groups will build a worm hotel and then observe how worms behave.

Some Helpful Information:

Worms can devour their own weight in animal, leaf and other plant matter every day. As they chew their way through the soil they mix and aerate it as well as depositing lots of nutrients in the soil. Worms are one of nature's important recyclers. They take old decaying matter and turn it into rich soil that can provide nutrients for a whole new crop of plants. When you see a worm in the garden keep it out of harm's way.





Worms

TIME:

1 hour

MATERIALS:

- Worms, 2 per group (from soil or bait shop)
- Potting soil
- Clean sand and garden soil
- Large opening, large clear glass jars
- Small tin cans spray bottles
- Old screening, or perforated lid to cover jar and allow air circulation.
- Rubber bands to hold screening
- Worm food: old leaves, coffee grounds, cornmeal, tiny fruit and vegetable scraps
- Black construction paper
- Tape

PREPARATION:

1. Gather materials and review procedure.
2. Depending on the size jars you have you will need more or less soil. (See directions for building a worm hotel.) Try setting up a worm hotel so you can estimate if you have the right amount of soil, etc. If you use gallon jars (often available from delis and restaurants) you can use 3-4 worms per container.
3. **IMPORTANT!** Be sure the jars don't dry out or get hot. This would kill the worms! Someone has to care for them over the week between meetings. A cool dark place is ideal for letting them sit. A light spray of water should keep them moist (not soggy.)

STEP BY STEP:

1. Ask if anyone has seen worms. Does anyone know why they come above ground when it rains? (They are escaping soggy tunnels where they can't breathe.)
2. Distribute the handouts. Have everyone look them over and draw a worm.
3. Have each group make a worm hotel using the illustrated directions.
4. Distribute damp paper towels and worms. Have every one complete the handouts.
5. Place worms in their hotels.
6. Next week have everyone answer the final questions on their handouts.
7. Release the worms in the garden.

EXTENSIONS:

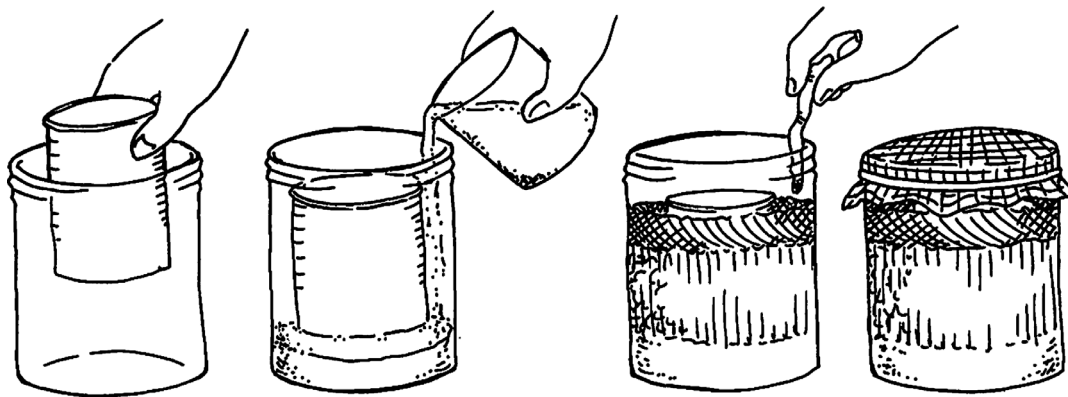
- Time how long worms take to burrow.
- Try starting seedlings in a pot that has a worm and try one without. Is there any difference?

Worms

Handout #1

HOW TO BUILD A WORM HOTEL

1. Place can open end down in center of jar. (The can will encourage the worms to stay out at the edges of the jar where you can see them.)
2. Place a 1-2 inch layer of sand in the jar, keep can in the center of jar.
3. Next make a layer of garden soil deep enough so the jar is $\frac{2}{3}$ full. Be sure can doesn't move. LIGHTLY pack soil so it fills the container. You don't want it packed tightly!
4. Fill jar up with potting soil, pack lightly. Leave 1-2 inches of jar empty. Draw a picture of your "hotel" on your handout showing the layers of sand, garden soil and potting soil.
5. Make a SNUG fitting black cover for the hotel. Hold it with tape.
6. Dampen the soil thoroughly. Be sure it's not soggy.
7. Make small mounds of different worm foods on the surface around the edges.
8. Gently place the worms on the potting soil. Leave the jar covered for a week before looking in on the hotel guests.



Worms

Handout #2

DRAWING & WRITING ALL ABOUT WORMS

1. What color are your worms? _____

2. Do they look like your drawing? _____

3. Make another drawing.
4. Do you see the lighter color wide band where the baby worm eggs come from? _____
5. Draw your worm hotel:
6. How might it look next week? _____

Worms

Handout, continued

7. Draw the hotel again:

8. What differences do you see? _____

9. Did they eat all their food? Did they like one food better than another? _____

10. Why do you think worms would be good to have in the garden? _____

The Spice of Life

15 GARDENING
ACTIVITY

Summary:

Groups will get information sheets on a specific herb. They will taste/smell, plant and read/hear about the herb, then report their findings to the rest of the groups.

Some Helpful Information:

Herbs are used in many ways and have been for centuries. Although research does not always support their use as beneficial, folklore stories and legends about their powers have been passed down for generations. You may know of someone who uses herbs in special ways. Many people use herbs to flavor food and provide attractive garnishing.

Nosegays, bundles of aromatic herbs, make nice sweet-smelling gifts that can be used to perfume a room. Many people use simmering herbs as an air freshener, especially in winter when houses are closed up and stuffy.

Herbs in the garden serve more than one purpose. Peppermint grows well in a damp area and makes a pretty plant around the hose bib. It also helps repel ants. Coriander is a food flavorer, yet also attracts helpful insects to your garden that feast on garden pests. There are varieties of rosemary that are fine for cooking, are drought-tolerant and can be a good hearty ground cover.

With a little research you can find an herb to meet culinary, household and gardening needs.

Why Do This?

Herbs are great for cooking with, but many work double time helping reduce insect problems. Group members will remember what the herb they have worked with does because they will have some tangible experience working with it.





The Spice of Life

TIME:

1+ hour(s)

MATERIALS:

- Fresh garlic
- Aromatic geranium seedling(s)
- Some dry catnip and catnip seeds
- A six-pack of marigold seedlings
- Some cilantro and cilantro seed (same as coriander)
- Peppermint and a peppermint seedling or rooting
- A six-pack of calendula seedlings and a calendula product (soaps, oils, balms, all available at health food stores)
- Dried basil (the herb) and a six-pack of basil seedlings planting materials

PREPARATION:

1. Gather materials
2. Decide how the groups will be split and how the herbs will be assigned.

STEP BY STEP:

1. Have a general discussion about herbs. Ask what people's favorites are.
2. Distribute handouts, herb samples and planting materials.
3. Let everyone know they are to:
 - Learn about their herb
 - Decide where it's best planted
 - Plant it
 - Share that information with the rest of the groups.
4. When all the planting is done, have the groups share what they learned.

EXTENSIONS:

- Go to a nursery and see all the herbs they sell.
- Have folks look in a cookbook for their favorite food. Is an herb called for that can be grown in the garden?

The Spice of Life

HERBS AND LEGENDS ABOUT THEIR USES

Garlic

This herb can repel many pests if it is interspersed throughout the garden. Garlic can also be used as an antibiotic for plants. If the cloves are put through a blender and mixed with water the liquid can be sprayed on plants suffering from many infections. Garlic is also



a favorite herb used in cooking. Everyone seems to like spaghetti with garlic sauce.

Plant by breaking apart

the cloves. Plant pointed end up, about 2 inches deep. Garlic likes rich soil and full sun.

Geranium (pelargonium)

These beautiful flowers can drive away beetles. There are many varieties of geranium. Some are large plants growing 3 feet tall. Tiny creeping scented varieties that smell just like lemons, roses or mint may only grow 5 inches tall. Perfumes are made from the leaves and American pioneers would soak some leaves in water to place on the forehead of someone with a headache. There are



also trailing ivy-type varieties. Each is planted in different spots.

This was a favorite flower of the early Americans, often grown in window boxes. Rose scented geraniums can be used to make jellies and cakes.

Geraniums can be grown from cuttings. Take a piece from another large healthy plant, remove a few of the lower leaves and any flowers. Place the broken stem in moist rich soil and in about 4 weeks a new geranium plant will grow. Most geraniums like a relatively cool location in the garden, but protect from winter frost. In hot climates a half a day of sunlight is plenty. In cooler climates they do best in full sun. For best growth, keep moist, although they are fairly drought resistant.

Catnip

This herb can be made into a tea or dried and given to cats for their pleasure. Catnip is hearty and will bear flowers all summer if it is cut back after its first bloom. It is very drought tolerant. Plant it where it won't be watered too much.

Although cats seem to prefer the dried leaves and flowers, if planted to the side of the garden, catnip helps to keep cats out of the rest of the garden by distracting them.

Catnip can deter the flea beetle, so plant it near potatoes, eggplants, tomatoes, cauliflower and beets. Catnip's pretty flowers are also good for attracting bees to your garden. Bees are good to have because they help make sure



the flowers get pollinated and make more vegetables for eating.

Cilantro

This plant has two names.

When eaten as a leafy green plant it is known as cilantro, often used in Mexican or Chinese dishes. The seeds are also used as an herb, called coriander. Coriander is used in stews, sausage, gingerbread, cookies and candy. This is one of the earliest known spices. It was found in Egyptian tombs and used in Rome as a meat preservative.

The plant will produce a lot of seeds that should be harvested early, otherwise they fall to the ground and you have a lot more plants growing in no time. They like full sun, rich soil and regular watering. These plants grow well from seed.



The Spice of Life



Marigolds

These come in a lot of different colors. You can get red ones, orange ones, gold ones and

ones that are mixtures of these colors. Some grow tall, up to 2 feet. Others stay low-6 inches tall. They all like sun and rich soil. Many gardeners consider the scented marigolds the work horses of the garden. Marigolds deter a lot of different garden pests. Plant them throughout the garden. Planted in large numbers they will repel nematodes (they attack potatoes) and bean beetles particularly well.

If there are a lot of earwigs in your garden, you may find it difficult to grow marigolds, because earwigs love them. The good news is that the earwigs spend all their time eating your marigolds and are less likely to munch your bean, cucumber and lettuce seedlings!

Calendulas are also in the marigold family. There are a lot of skin healing products made with calendula. The bright flowering plant can keep merry yellow and orange flowers blooming in the garden well into the cold season. Petals from the flowers sprinkled into salads add a delightful splash of color.

Mint

This plant will deter the white cabbage moth and ants. (Ants can bring aphids into your garden.) There are several varieties, even one that smells like lemon! Mint usually grows heartily anywhere that stays moist. A couple of cuttings placed in the ground near a hose bib where a lot of water drips will often grow well with little attention. Peppermint will deter the white cabbage butterfly and serves the gardener well when planted with the cabbages.

Mint can be used to make hot or iced tea. Mint tea is known to aid digestion. It adds refreshing flavor to ice water on hot summer afternoons and makes an attractive, nicely scented and tasty garnish on a scoop of ice cream!



Basil

This is a popular culinary herb. Pesto, made from basil, is used on pasta, in soups and lots of other dishes. Basil is a member of the mint family. It has the classic square stem common to this family of plants. Basil grows well from seed, or seedlings can be transplanted into the garden. The plants like full, warm sun and are not frost hardy. The leaves can be used fresh or dried.

This highly aromatic herb is supposed to repel mosquitoes and flies. Planted next to tomatoes it repels insects and helps the plants resist disease. These two vegetable plants are great when cooked together and grown together.

Gardening Workout

16 GARDENING
ACTIVITY

Summary:

This activity will help youth recognize that working in the garden helps them stay physically active.

So Helpful Information:

The **2015-2020 Dietary Guidelines for Americans** provides recommendations for physical activity guidelines for different age groups. It is important to recognize that besides eating healthy foods, regular physical activity is one of the most important things Americans can do to improve their health.

- Adults need at least 150 minutes of moderate-intensity physical activity per week, and should perform muscle-strengthening exercises on 2 or more days each week.
- Youth ages 6 to 17 years need at least 60 minutes of physical activity per day, including aerobic, muscle-strengthening, and bone-strengthening activities.
- Older adults should follow the adult guidelines if they can. If they are not able to meet the adult guidelines, they should be as physically active as their abilities and conditions allow.

Encourage children and adolescents to participate in physical activities that they find enjoyable. Most of the 60 or more minutes a day should be either moderate or vigorous-intensity aerobic physical activity. As part of the 60 minutes or more of daily physical activity, they should include muscle-strengthening physical activity on at least 3 days of the week and bone-strengthening physical activity on at least 3 days of the week.

- **Aerobic physical activity** increases a person's heart rate and breathing from a moderate to a great extent. Aerobic activities increase cardiovascular fitness over time. Examples are running, hopping, skipping, jumping rope, swimming, dancing, and bicycling.
- **Muscle-strengthening physical activity** makes muscles do more work than usual resulting in stronger muscles. This type of activity increases skeletal muscle strength, power, endurance, and mass. Examples are climbing trees, playing tug-of-war, push-ups, pull-ups, sit-ups, lifting weights, or working with resistance bands.
- **Bone-strengthening physical activity** produces an impact or tension force on bones, which promotes bone growth and strength. Examples are running, jumping rope, lifting weights, basketball, volleyball, tennis, and hopscotch.

(Source: <https://health.gov/paguidelines/>)

Why Do This?

Eating right is not the only thing that helps our body stay healthy. Being physically active is also important for maintaining a fit and healthy body.



Gardening Workout

TIME:

1 hour

MATERIALS:

- Garden tools or pictures
- White board and markers

PREPARATION:

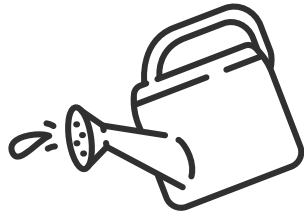
1. Gather materials
2. Make copies of "Gardening" worksheet



STEP BY STEP:

1. Growing foods in your own garden is fun. But, do you know that gardening is a great way to be outdoors enjoying fresh air and getting some exercise at the same time?
 - Why do you think it's important for us to exercise and be physically active? (Build strong heart, muscles and bones. Help our bodies to be more flexible).
 - Discuss the three different types of physical activities (aerobic, muscle-strengthening, bone-strengthening).
 - How much physical activity do kids need? (at least 60 minutes a day of varying types of activities).
2. We need to take good care of our body by eating healthy foods and being physically active. Help students understand that they can be physically active working in the garden.
 - Let's make a list of activities we can do in a garden. Ask students to brainstorm ideas. Make a list on the board. (pulling weeds, hoeing weeds, raking leaves, shoveling soil, digging, planting, trimming trees, pruning shrubs, pushing a wheelbarrow, watering plants, removing rocks, spreading compost, etc.)
3. Ask the group to stand up and do warm-up stretching for a few minutes. Discuss why it's a good idea to do warm-up stretching for 5-10 minutes before you exercise (gardening included) –A warm-up prepares the body for work by loosening the joints and gently stretching the muscles).
 - Distribute the gardening workout handout. Have students do each garden activity on the list and make a note of which part of the body is working. For example, watering plants involves lifting and carrying a watering can, so the muscles in your arm (lifting) and hands (gripping) are working.
 - Take a look at the list afterward and discuss how much work the body has to do to get each job done. Which activity is more or less strenuous compared to each other?
4. Remind students to protect themselves from potential sun exposure and dehydration if they are going to work out in the garden for a while.

Gardening Workout

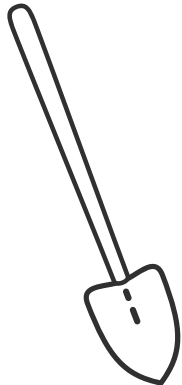


Watering Plants

Body Parts using:

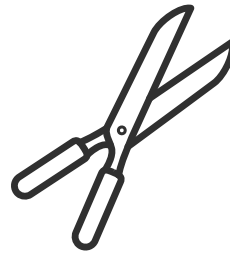
Hands

Arms



Shoveling

Body Parts using:



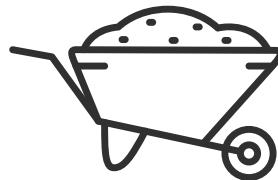
Trimming Plants

Body Parts using:



Raking Leaves

Body Parts using:



Pushing a Wheelbarrow

Body Parts using:

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Food Preparation

METHODOLOGY AND HINTS

Most activities provided involve dividing youth into smaller groups for preparation of different recipes that they report on and share with the large group. Each activity suggests a division of the larger group, but adults are always encouraged to diversify makeup of each - combine younger and older youth, combine genders, and particularly if a group has a number of young children, provide older teens or an adult advisor to work directly with that group.

Generally, everyone prepares different recipes at the same time in groups, then shares their dish with the rest of the group.



SUPPLY TABLE

A method that works well is having all supplies that all groups will need on a central supply table. Groups should send runners for specific items called for in their recipe, use what is needed, and as soon as finished, return it to the supply table for others to use. This works well for all food preparation equipment and supplies, including utensils, food items, and serving dishes. Each activity lists specific supplies needed. Remember to bring or make sure sponges, detergent, dish cloths and/or paper towels are available to help with cleanup.

Remember, as supplies are gathered and transported to the location of the activity, keep cold foods cold and hot foods hot.

RECIPE DIRECTIONS

To prepare for a hands-on food preparation activity, write each group's recipe in large print on butcher paper. When posted near their station the day of the activity, it is easier for the group to read and follow on their own as they prepare their item.

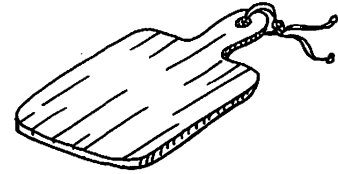


Food Preparation

GROUND RULES

1. **Always wash hands before working with food.** This is an extremely important guideline that makes eating healthier and safer. It means warm, soapy water for a minimum of 40 seconds as most effective in reducing the number of germs on hands.

Nutrition Activity #2, Safe and Clean, is designed to emphasize basic guidelines for safety and cleanliness in food preparation. This activity is recommended before other food preparation activities are included in project work.



2. **Everyone has something to do.** Dependent on age, either have group members organize themselves and be responsible for making sure that the work is fairly distributed or have older teens and adults assist in the division of responsibilities so everyone participates equitably.
3. **Walk, no running.** Accidents are more frequent when care is not taken to walk.
4. **One person working with an appliance at a time.** Be sure to tape down extension and appliance cords. Tie a loose knot where the extension and appliance cords meet so that there will be some "give" in case they are tugged.
5. **Knives stay at the table.** Sharp knives can be used by elementary age children safely. It is very important that safety is discussed each time they are used.

Some helpful knife safety rules to review with children:

- Always keep the cutting side of the blade pointed down toward the table.
- Always keep the sharp point of the blade pointed toward the center of the table and away from people.
- Always cut "away" from yourself, not "towards" you.
- Use only when cutting food.
- Don't cut into the food in the air, but place the food item on a cutting surface, and cut through the food into the cutting board.

If you have large groups of young children and/or limited older youth and adult presence, plastic knives can be used particularly well when cutting soft fruits, such as those used in fruit kabobs.

Allow children to handle knives only when cutting food.



Vitamin Values

1 NUTRITION ACTIVITY

Summary:

The group discusses different foods and the vitamins they supply. A drawing helps identify how the body uses the basic vitamins and minerals. A person's outline is traced onto paper and then everyone glues pictures of the foods to the appropriate part of the body. As they do this they review the nutrients that foods supply and how they help us stay healthy.

Some Helpful Information:

There are lots of different vitamins and minerals that help keep us healthy. Iron is a mineral that is in our blood. Without it we would all suffocate because it carries oxygen from our lungs to every cell in our body. Calcium is another mineral. It helps make strong bones and healthy teeth. Vitamin A helps our eyes stay healthy and see in the dark. Vitamin C is one that helps us heal scrapes and bumps. These and others help keep our body functioning optimally so we can stay healthy and get better quickly when we have an illness or injury.

These vitamins and minerals are most often found in fruits and vegetables. That is why it is healthy to eat lots of fruits and vegetables every day. Some of the vitamins our body needs (like B and C) dissolve in water. These vitamins get washed through our body and need frequent replacing for optimal health. Other vitamins are fat soluble (like A, D, E, and K). These do not leave the body as quickly. Our bodies can store up these so we don't need to eat them daily. It is possible to get too much of a vitamin or mineral, especially when taking them in pill or other supplemental form. Eating a balanced diet that includes a different vegetable or fruit five times every day is the best way to get the vitamins and minerals you need.

Why Do This?

Everyone hears, "Eat your broccoli, it's good for you" but rarely does anyone know why it's good. This activity makes the connection between different food types, the nutrients they supply and how they help keep us healthy more apparent.



Vitamin Values

TIME:

1 hour

MATERIALS:

- Newsprint
- Magazines with pictures of foods
- Papers
- Crayons/pens
- Glue/tape
- Small samples of orange, potato, cabbage, carrot, cereal, milk, broccoli, pasta, rice (can use pictures instead of the actual food)

PREPARATION:

1. Gather materials. Newsprint is inexpensive when roll-ends are purchased from a local newspaper.
2. Label each food with the vitamin associated with it.

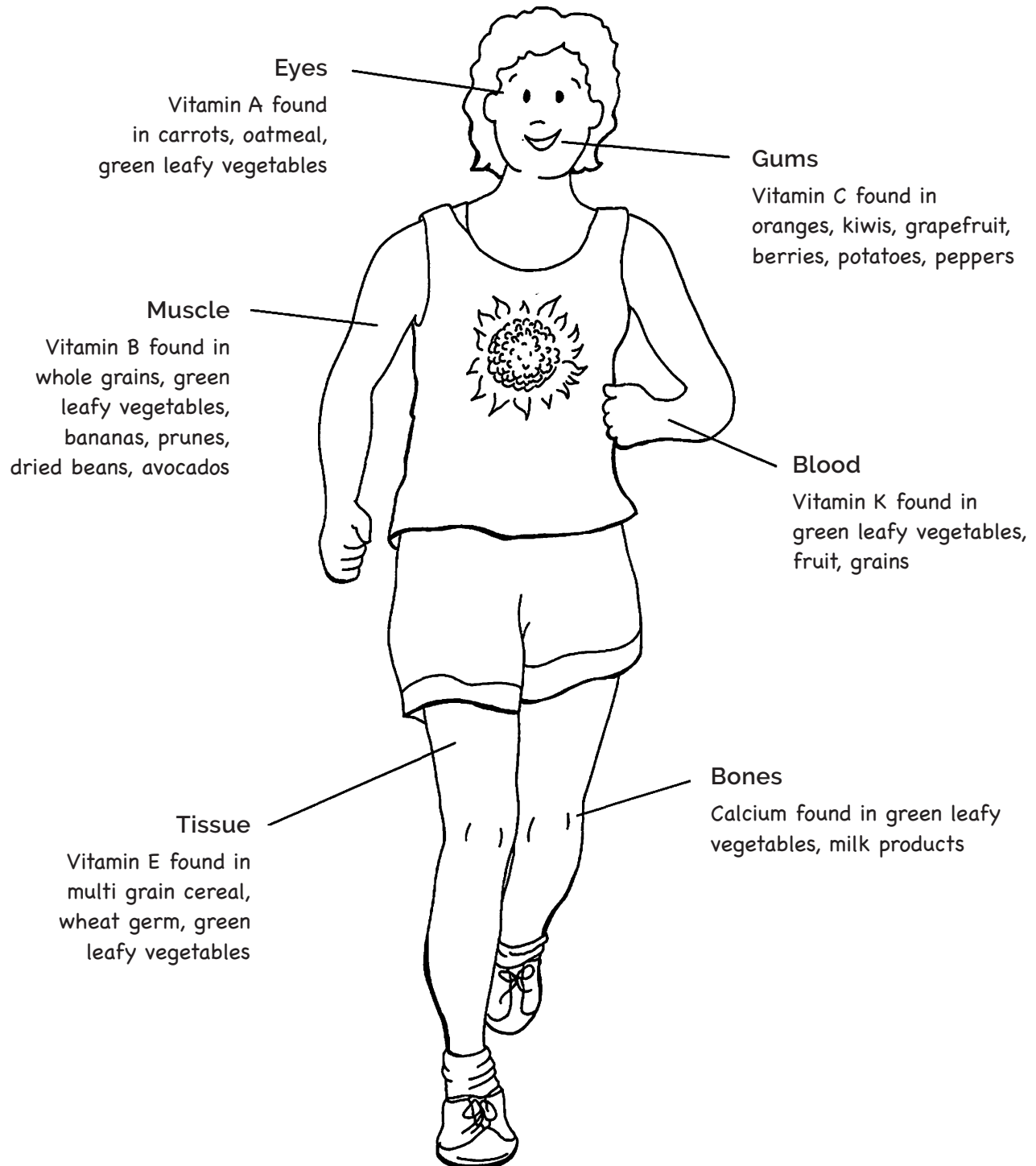
STEP BY STEP:

1. Hand out "Vitamin Values." Discuss the illustration. Ask "Where does Vitamin A come from? What part of our body does it help?" etc.
2. Hold up the food samples you brought and have the group tell you what vitamins each contains and what part of the body it helps.
3. Divide into groups and give each group a piece of paper. Choose a person from each group to be traced around.
4. Have the person lie down and trace around them onto the paper.
5. Go through the magazines and cut out pictures of foods that provide vitamins and minerals. If a picture can't be found have the groups make drawings of a food type.
6. Have each group glue the pictures to the drawing on the body part it helps.
7. Have each group share their picture-covered person with the other groups.
8. Have the entire group come up with a day's menu that includes at least 1 cup each of fruits and vegetables (daily recommendation amounts vary based on age, sex, and level of physical activity).

EXTENSIONS:

- Have everyone draw what they ate for breakfast and lunch that day and talk about what kind of vitamins they ate.
- Send home a paper that asks them to keep a record of what they eat in the way of fruits and vegetables each day until the next group meeting. This way their families will see the list and may learn about the "five a day" rule.

Vitamin Values



Why Do This?

It is easy to forget to wash our hands before cooking or working with food. This lesson makes the contamination of foods very visible. Using knives and stoves correctly and working safely while cooking can prevent painful accidents and illnesses.

Safe and Clean

Summary:

The group will discuss kitchen safety and cleanliness. Everyone will get to do an experiment to see what happens to food that is exposed to dirty hands and compare it to food handled with clean hands.

Some Helpful Information:

There are some basic safety guidelines that make cooking safer and eating healthier. One of the more obvious safety hazards in the kitchen is knives. It is important to learn how to use a knife safely. We should never cut with the blade of the knife facing towards us or others. Always cut down onto a cutting board. If there are any slips the knife hits the board harmlessly. Knives should not be dropped into the bottom of a full sink. A knife buried in the sink can cut anyone who reaches in to wash or grab something. It is wise to clean knives and put them away when not in use. If they are to be set down, point the blade away from people and set it somewhere that is out of reach of little ones.

Thinking ahead and prevention help avoid all sorts of accidents. Pots on the stove should have their handles turned in so a bump doesn't tip and spill the hot contents. Electric cords must not be near water or handled by wet hands or persons standing in puddles. Don't let cords dangle where you could accidentally jerk them off the counter. Keep anything flammable away from the stove to prevent fires and burns. Don't leave burners on if they are not in use.

Be sure your cooking area is clear and safe. Don't leave things around that could cause you to trip or distract you. Take care to keep sharp things where they belong. Be aware of hot pots, hot foods and hot burners to prevent burns.

Another safety concern around food is cleanliness. If food is contaminated it can spoil and even make people sick. This is why it is important to get in the habit of keeping hands, cooking areas and materials clean. The human body is host to millions of bacteria that do us no harm. Unfortunately, we can carry bacteria that are bad for us and not know it. Because bacteria are everywhere, we come in contact with them all the time, every time we touch anything. Our noses, mouths and throats carry the viruses and bacteria of any cold or other flu-type bug we may have or be immune to and just be carrying. When we sneeze we are setting off a spray of germs.

continued



Safe and Clean

Helpful Information, *continued*

Germ (like us) tend to like a warm home. That's why we refrigerate food, to prevent yucky stuff (bacteria) from growing on our food.

Experiments show that washing hands with warm soapy water for a minimum of 40 seconds will greatly decrease the number of germs on our hands. Rinsing hands quickly in cool water helps, but not nearly as much as the 40 second hot and soapy wash. If we wash this way before handling food we will greatly reduce the number of little beasts that get onto our food and the food we prepare for others. Keeping hair and other things out of the food will decrease chances of contamination as well. No one likes to find a hair or bugs in their food. Keeping hair tied back and the kitchen free from insects, covering food that is left out and refrigerating food all help to prevent the growth of things that would spoil our food.

TIME:

1 hour

MATERIALS:

- Ziplock bags, two per person
- Bread, two slices per person
- Masking tape
- Pen
- Copies of the "Safe and Clean" handout

PREPARATION:

1. Collect materials.
2. Review the picture so you can help folks identify the safety elements.

STEP BY STEP:

Part One: Safety

1. Have a discussion about safety in the kitchen. Encourage participants to come up with some good safety tips. Let anyone who would like to relate how they or someone they knew got hurt in the kitchen.
2. Distribute the picture. Tell everyone that the asterisk indicates a factor in this kitchen that helps make it safe. Have them discuss and identify what safe practice the asterisk is identifying.

continued



Safe and Clean

Instructions, *continued*

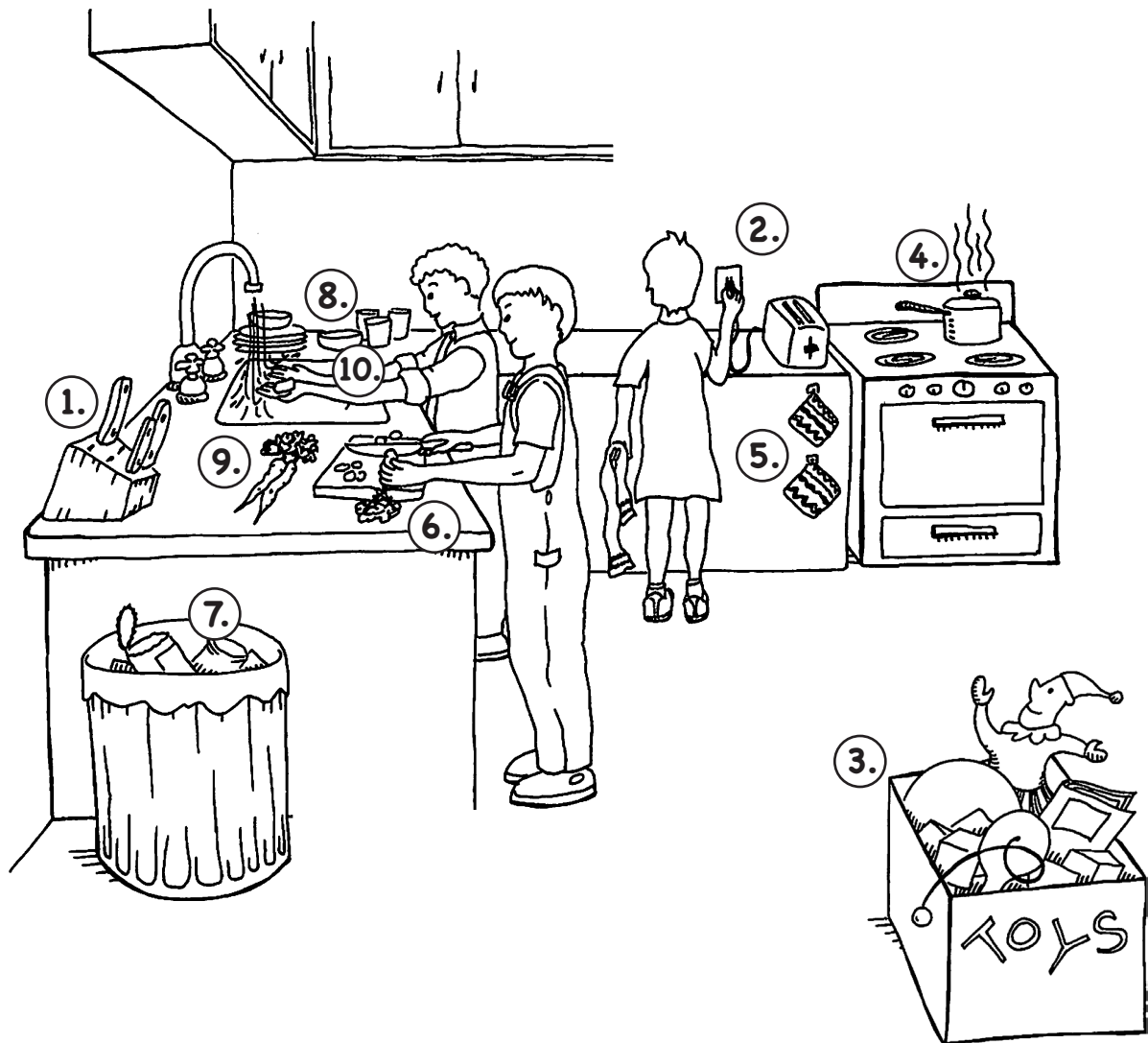
Part Two: Hygiene

1. Explain to everyone that they are going to see what kinds of germs there are on unwashed hands. Talk about how bacteria are everywhere. Many live on us all the time and do us no harm. Some bacteria can make us sick.
2. Have everyone take a baggy and a slice of bread. Explain that they are to wipe the invisible bacteria off their hands onto the bread. Once they have done this they are to lightly moisten their bread with a sprinkling of water. Seal it into the zip lock bag. Label the bag using the tape and pen. Put the person's name, the date and "dirty hands" on the label.
3. Have everyone wash their hands in warm soapy water for 40 seconds minimum. Dry them on a clean paper towel. Repeat the bread-wiping process. Moisten the bread, place in a bag and label again with name, date and this time "clean hands."
4. Have everyone predict what they think will happen when they look at the pieces of bread next week.
5. The leader takes all the baggies and keeps them in a warm place. Over the next two weeks everyone checks to see if their predictions came to pass.

EXTENSIONS:

- Try treating some bread slices differently. Put some baggies in the fridge, some in a hot place. Wipe feet or sneeze on the bread. Place some in open air for a day; then moisten and bag the bread.
- Have someone wipe rubber gloves that are washed in anti-bacterial soap on bread and see what the differences are.
- Have folks go home and check their home kitchens for safety. Have them be official "Safety Marshals" and teach their household about kitchen safety.

Safe and Clean



Safe Kitchen Key

1. Knives in Butcher Block
2. Someone who has Dried their Hands, with Towel, Plugging in Toaster
3. Toys Stacked Neatly to One Side
4. Pan on Stove with Handle Turned In
5. Pot Holders Hanging Away from Burners
6. Someone Cutting Properly at Cutting Board
7. Open Can Lid in Trash
8. Dirty Dishes Stacked Safely (Not Tall)
9. Clean, Organized Counter Top
10. Someone Washing Hands with Soap

Eat Your Plants

NUTRITION ACTIVITY 3

Why Do This?

Fruits and vegetables are often lacking in our diets. Familiarity with these foods will encourage consumption. Youth who participate will be able to identify plant parts and know how they are related to the food we eat. They may learn that different people eat different plant parts. New kinds of food can be discovered this way as well.

Summary:

The group will examine many different foods and learn where they come from and how they grow.

Some Helpful Information:

There are six basic plant parts: roots, stems, leaves, flowers, fruits and seeds. We eat all of these plant parts of various different growing plants. A classic root food is the carrot, stems that we eat are celery and rhubarb. Leaves? How about lettuce? Nasturtiums are edible flowers. Fruits are easy to think of (apple), and seeds (peanuts), too.

Here is a list of plant parts and the food that we get from them.

ROOTS:	carrots, turnips, rutabagas, beets, radish, parsnip, jicama, sprouts
STEMS:	celery, broccoli, bok choy, asparagus, cauliflower, rhubarb, sprouts, nopales (cactus), potato, yam, onion, garlic (these stems seem like roots, but they really are under ground stems)
LEAVES:	lettuce, spinach, chard, bok choy, cabbage, greens (mustard, collard, beet...), asparagus, cilantro, parsley, basil, oregano, sprouts
FLOWERS:	broccoli, cauliflower, squash flowers, nasturtium, asparagus, saffron
FRUITS:	squash, cucumber, tomato, pea pods, green beans, grapes, apples, pears, oranges, rose hips, peppers, eggplant, olives, peach
SEEDS:	nuts, beans, rice, wheat, oats, corn, peas, pomegranate, peanuts



Eat Your Plants

TIME:

1 hour

MATERIALS:

- Paper bags
- A large assortment of foods from each plant-part-group
- A large writing surface. A chalk board is great, or tape up a large sheet of paper
- Pens or chalk
- Copies of the "Eat Your Plants" handout

PREPARATION:

1. Make photocopies and collect other materials.
2. Put some food samples from each plant part into bags. Each group needs a bag that contains at least six pieces of food; one that demonstrates each plant part.

STEP BY STEP:

1. Have everyone think of a fruit or vegetable or any other plant-food and call it out. As they call them out start listing them on a piece of paper. List all the root foods at the bottom. Next up would be stem foods. Moving upward would be leaf, flower, fruit and seed foods. See if anyone can figure why you put them in the lists you are making. Draw a plant next to your list as a big hint (see illustration.)
2. Hand out the drawing of a plant showing the plant parts. Pick out some broccoli and discuss the plant parts. Point to the corresponding parts on the picture. (Broccoli will have stems and flowers and often leaves as well.)
3. Demonstrate with a bag how they are to explore their plant foods.
4. Each group will get a bag. Group members take turns (youngest first.) The first group member feels a food inside the bag without looking and tries to identify the food by name and/or plant part.
5. This person then takes that food out of the bag and figures out (with the group's help) what plant part(s) it comes from. The next person repeats the process, first guessing by touch, then taking the food out and discussing/describing it.
6. Have each group share what they had and talk about the foods. Are they the same? Did they taste them?
7. Have everyone think of their favorite fruit or vegetable and name it. They can add why they like it and how or when they eat it.
8. Distribute the picture of a meal and have them categorize the foods by plant parts.

EXTENSIONS:

- Have groups make up a meal that includes every plant part and draw it.
- See how many plant parts could be in one food. For example, pizza has four plant part groups: fruit (tomato, olives), seeds (wheat), stem (garlic, onion) and leaves (oregano and basil).
- At home have them draw their dinner and categorize as many parts of it as they can.

Eat Your Plants

Leaf

Uses sunlight and chlorophyll to convert CO_2 and water to sugar; gives off water to regulate temperatures; gives off O_2 ; some can produce new plants.

Stem

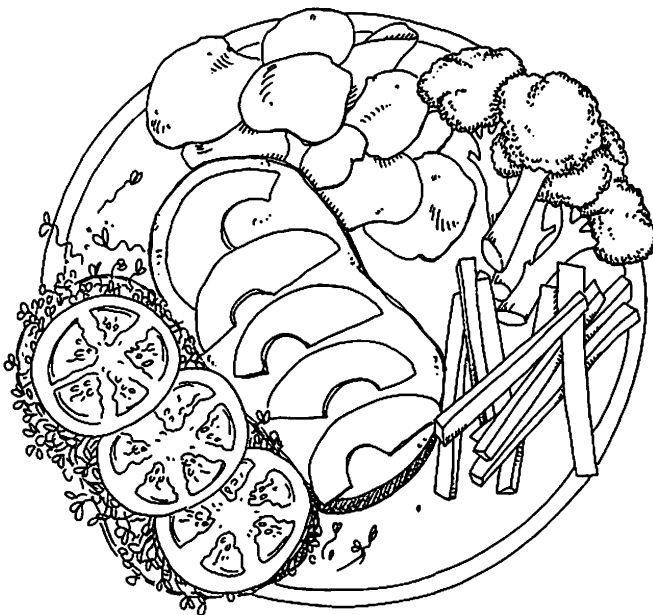
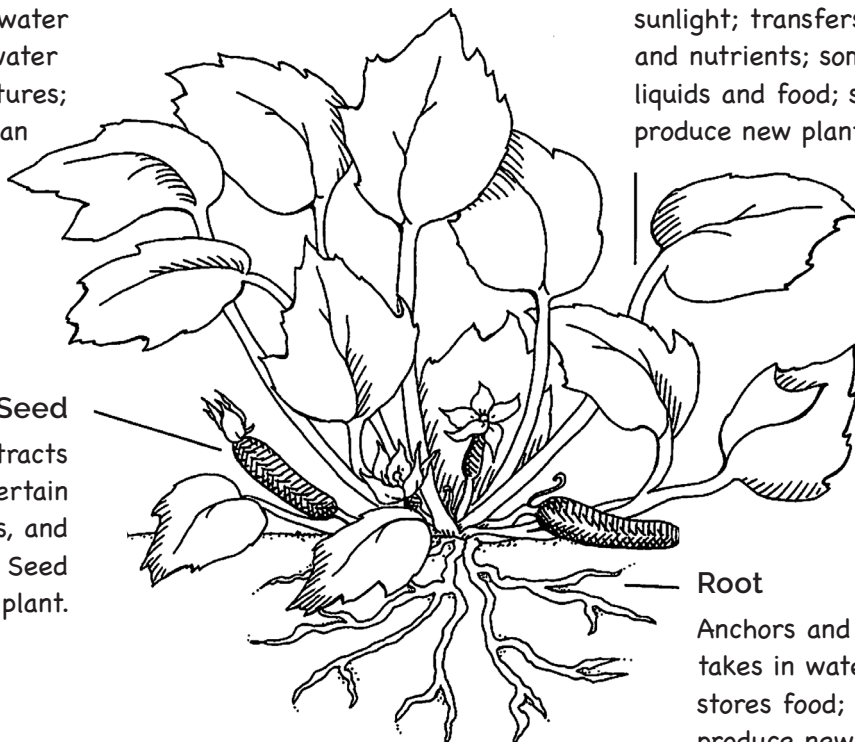
Supports leaves to get sunlight; transfers water and nutrients; some store liquids and food; some can produce new plants.

Flower/Fruit/Seed

Produces seed; attracts and feeds certain birds, insects, and other pollinators. Seed produces new plant.

Root

Anchors and supports plant; takes in water and nutrients; stores food; some can produce new plants.



Plant Parts Meal:

avocado sandwich with sprouts and tomato
baked potato chips
carrot sticks
broccoli flowerets

Fabulous Fruits

4 NUTRITION ACTIVITY

Summary:

Groups will make fruit salad and fruit kabobs. As everyone eats, you can talk about why fruit is healthy and where it comes from.

Some Helpful Information:

There are lots of good reasons to eat fruit. The first reason is it tastes great. As a snack food it provides vitamins as well as fiber, and no fat. Fruits contain chemicals called carotenoids that help prevent certain types of cancer. Folacin, a B-Vitamin, is also found in fruits. It is very important for pregnant women. The vitamins, minerals and fiber found in fruit are good for people of all ages. Whole uncooked fruits have the most nutrients. Canned, frozen, dried and juiced fruits, 100% fruit juice are also good choices if fresh fruits are not available or too costly. Fruits are part of the MyPlate fruit group (see Nutrition Activity 11 - MyPlate), and should be eaten every day for a healthy diet. One cup of fruit or 100% fruit juice or 1/2 cup dried fruits would count as one cup of fruit (daily recommendations vary based on age, sex, and level of physical activity).

Putting fruit in school lunches and eating them for snacks is a great idea. You can serve fruits with every meal. Keep a bowl of fruit around. Keep washed whole or sliced fruits in the fridge for children and adults to snack on. Buy whatever fruit is in season and you'll save money.

Some fruits that supply Vitamin A are cantaloupe, apricots and persimmons. Remember that Vitamin A is good for growth and for your eyes. Vitamin C helps to heal wounds and hold body cells together. It's found in oranges, grapefruit, cantaloupe, and strawberries. Try to include unusual fruits like kiwis, persimmons, star fruit, kumquats or any others you can find.

For this activity half the class will make fruit kabobs and the other half will make fruit salad. Groups should have an adult to keep an eye on knives. Assign half the groups salad and the others kabobs.

Why Do This?

With some exposure to good fruit perhaps people will be more likely to reach for an apple or pear rather than a candy bar or potato chips next snack time.



Fabulous Fruits

TIME:

1 hour

MATERIALS:

- Chalk board or paper and pen
- Globe
- Fruits of all kinds, as wide a variety as possible
- Lemons (for juice)
- Large mixing/serving spoons
- Bowls
- Skewers (short ones or break them in half)
- Knives (several serrated plastic and one large sharp one for pineapple)
- Spoons and cups
- Napkins
- Towels
- Sponges for drips, spills, and clean up
- *Optional:* Yogurt, raisins, shredded coconut, chopped almonds

PREPARATION:

1. Collect materials.
2. Check out the recipes and the fruit available right now. Select the recipes that work best for your group and the current season of the year.
3. Make sure you know where all the fruits come from; if not, call the library, look in a dictionary or ask the produce folks at the store.

STEP BY STEP:

1. Ask everyone to think of their favorite fruit. Have them call them out. Write them on a board or piece of paper. When someone calls out one that has already been named, make a tally mark next to it. Talk about everyone's favorites and see if they know where each comes from.
2. Break into groups, distribute recipes and materials.
3. Each group makes their recipe.
4. Everyone gets to try everyone else's kabobs and salads.
5. When everyone is served and eating, take out the globe and talk about the fruits you are eating and where they are grown.

EXTENSIONS:

- Have everyone (who can) bring a fruit the day of the activity and include them in the kabobs and salads.
- Have everyone go to the grocery store and see how many of the fruits (and vegetables) they can name. Do you know where they are from?
- While at the store have the produce manager come answer questions and talk about different foods they sell.

Fabulous Fruits

Fruit Salad

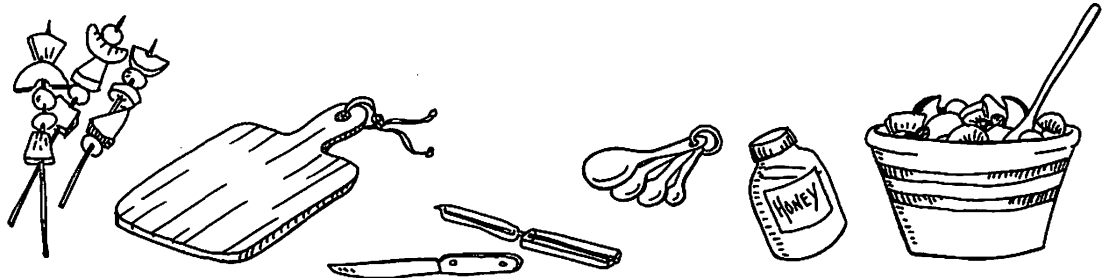
(about 10 small servings)

Ingredients:

3 apples
2 bananas
2 oranges
1-2 cups other fruits in season
(such as: apples, pears, bananas,
grapes, melons, pineapple,
nectarines, strawberries, kiwis,
oranges or tangelos)
honey

Directions:

1. Wash and dry all the fruit. Peel and core as needed. Cut into small pieces. Put all the fruit in a bowl and sprinkle with lemon juice. This keeps them from turning brown. (The brown is not bad for you – it just isn't pretty.)
2. Mix some juice from the bowl with a tablespoon of honey and stir it into the fruit.
3. *Optional:* Add three tablespoons of plain or flavored yogurt; sprinkle on some chopped almonds, raisins and/or coconut



Fruit Kabobs

Ingredients:

Assorted fruits in season (such as:
apples, pears, bananas, grapes,
melons, pineapple, nectarines,
strawberries, kiwis, oranges or
tangelos)
Lemon juice

Directions:

1. Wash and dry all the fruit; peel those that need peeling; cut rinds from melon. Core apples and pears, pit nectarines.
2. Using a cutting board, cut fruit into bite-sized chunks. Be sure the pieces are large enough so they don't fall apart.
3. Put all pieces in a bowl and toss with a bit of lemon juice. This keeps them from turning brown. (The brown is not bad for you - it just isn't pretty.)
4. Place chunks on the skewer sticks and arrange on a serving plate. Make enough for twice the number of your total group.

Ravenous for Roots

NUTRITION ACTIVITY 5

Why Do This?

Members get experience learning about, cooking, and eating some plants that grow underground.

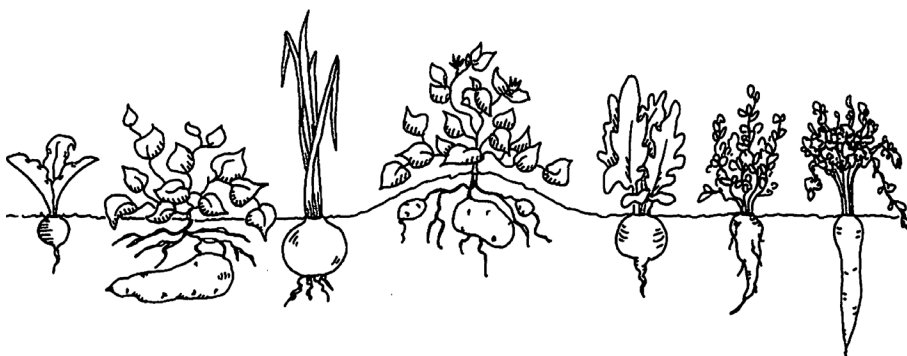
Summary:

Pairs of people will get a vegetable to look at and read about. Then they will talk to the rest of the group about it. Groups will prepare foods from roots and other underground growing vegetables.

Some Helpful Information:

We typically find roots of plants underground. Some plants actually have some of their stems there, too. There are vegetables that are true roots, like carrots, radishes, turnips, parsnips, rutabagas and beets. Other plants have underground stems-plant parts that bear roots and other plant growth, such as potatoes, onions, garlic, yams and sweet potatoes. Many of these vegetables are rich in vitamins, and all can be delicious to eat. One cup of any of these raw or cooked vegetables (including 1 cup of 100% vegetable juice) will count as one cup from the MyPlate vegetable group.

If you have a favorite recipe that would be easy to prepare with the group, use it in place of one of the provided ones.





Ravenous for Roots

TIME:

1-2 hours

MATERIALS:

See individual recipes for ingredients.

For cooking:

- electric fry pan
- microwave oven and casserole dish hot plate
- knives (see about handling sharp knives page 70)
- napkins, cups or plates, and utensils for eating towels
- soap and sponges for clean up

PREPARATION:

1. Collect the materials.
2. If you can, practice preparing the recipes ahead of time. Keep track of the procedure and times so you can give groups precise cooking times.
3. Decide ahead of time how you will group people. The baked sweet potato and mashed potato recipes can be done by relatively young kids.

STEP BY STEP:

1. Hand everyone one of the pieces of produce. Have a discussion on what each one is. If anyone has eaten them and knows recipes that use them, have them explain to the rest of the group.
2. Collect the materials again.
3. Break into groups and have each prepare one of the dishes in the recipes that come with this activity.
4. Encourage discussions about roots. Talk about how carrots are roots, potatoes are stems and onions are bulbs.
5. Have a feast and enjoy before clean-up time.

EXTENSIONS:

- Have everyone keep track of all the “underground” foods they eat during the week.
- Go to the grocery store and see how many of these kinds of foods are available in the produce section.
- Plant several types of potatoes in the garden. When harvested, cook them all the same way and compare, voting on favorites.

Ravenous for Roots

Group 1

Finger Salad

Materials:

knife, cutting board, serving tray

Ingredients:

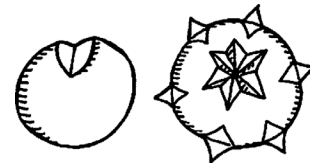
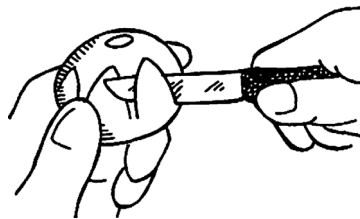
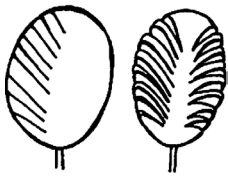
1 turnip

3 medium carrots

1 bunch of radishes

Directions:

1. Scrub turnips.
2. Peel skins off turnips. Slice them into "match sticks."
3. Scrub carrots, slice into bite size sticks.
4. Cut tops off of radishes, scrub and cut or serve whole.



Group 2

Mashed Potatoes

Materials:

hot plate, knife, masher, pot, bowl, serving spoon, cutting board, cup or mug

Ingredients:

4 large potatoes

water

salt, pepper and margarine to season

Directions:

1. Chop up potatoes, put in large pot.
2. Cover with water and boil until tender.
3. Pour water off, saving about 1 cup of it. Mash with a masher or fork.
4. Add back enough liquid to make a smooth, creamy texture.
5. Season with margarine, salt and pepper as desired.



Ravenous for Roots

Group 3

Sauteed Parsnips

Materials:

Electric fry pan, knife and cutting board, cooking spoon/serving spoon, measuring cup and spoons

Ingredients:

3 medium parsnips
1 medium onion
4 Tbs olive oil or margarine
2 Tbs soy sauce
 $\frac{1}{3}$ cup water

Directions:

1. Scrub parsnips; slice into $\frac{1}{4}$ inch rounds
2. Chop onion fine.
3. On medium heat, saute parsnips and onion in olive oil.
4. When onion is clear, add water and soy sauce.
5. Cover and let simmer on low heat until parsnips are tender.



Group 4

Baked Sweet Potatoes

Materials:

microwave, knife, cutting board, plate to serve from

Ingredients:

sweet potatoes
margarine
salt and pepper for garnish

Directions:

1. Scrub potato clean. Cut off $\frac{1}{2}$ inch from ends
2. Bake or microwave until tender.
3. Cut into small serving sizes. Eat like a baked potato.
4. Season with margarine, salt and pepper as desired.



Group 5

Yams with Apple

Materials:

microwave, knife, cutting board, covered casserole, measuring cup and spoons, plates

Ingredients

2 medium yams
2 large green apples
 $\frac{1}{2}$ cup brown sugar
3 Tbs margarine

Directions:

1. Scrub 2 medium yams; slice into $\frac{1}{4}$ inch rounds.
2. Wash, core and slice two large green apples.
3. In a covered microwave or oven-safe casserole: Layer yam rounds, cover with apple slices, sprinkle on 1 Tbs brown sugar and dot with margarine.
4. Repeat until all yams and apples are used or you pan is full.
5. Microwave on high for 5 minutes at a time. Turn dish, check for doneness (done when tender all the way through.)

Sumptuous Seeds

NUTRITION ACTIVITY 6

Why Do This?

A lot of empty calories are consumed in the form of snack foods. Many kinds of seeds are quite nutritious and tasty.

Summary:

Seeds and nuts will be provided and pictures of the plants they grow on. Everyone tries to match the plant or nut to the right seed.

Some Helpful Information:

It's great if you have access to bring in nuts or seeds on a branch. Our foods often are so removed from their origins we forget they weren't manufactured! You can purchase all these nuts in the shell. There are hints provided with the plant pictures to help folks identify the right seed/nut.

Buy sesame seeds at a health food store; they are much less expensive than the ones on the spice rack at a grocery store. They will probably be dark in color. The color is from a very thin husk that is good to eat.

Some nutritional information (amount per tablespoon):

	Calories	Protein (g)	Fat (g)	Vitamins
Almonds	24	.8	2	C, B-6, B-12, iron, calcium
Filbert	34	.68	3.6	iron, calcium, C, B-6,
Peanuts	52	2.4	4.5	iron, calcium, B-6,
Pumpkin	48	2.5	4.1	A, iron, calcium, B-6
Sesame	50	1.6	4.4	LOTS of calcium
Sunflower	51	2.2	4.3	A, iron, calcium, B-6
Walnuts	52	1.2	5.1	A, iron, calcium, B-6, C



Sumptuous Seeds

TIME:

1 hour

MATERIALS:

- Nuts and seeds, in their shells: almonds, walnuts, peanuts, filberts, sunflower seeds, pumpkin seeds, sesame seeds
- 4 nut crackers
- Copies of "Sumptuous Seeds" handout
- Tape
- 7 bowls to put seeds and nuts out in

PREPARATION:

1. Make copies of "Sumptuous Seeds."
2. Collect other materials.
3. Review step by step procedure and look at the handout so you are clear about what folks will be doing.

STEP BY STEP:

1. Have people get in pairs. There needs to be a strong reader in each pair.
2. Distribute a copy of "Sumptuous Seeds" to each pair. They are to go to each bowl and try to match the seed or nut to the plant picture on the page. When they have decided/guessed they tape a sample of that nut on the paper where indicated.
3. When everyone is done you show them the answers and they check their own work.
4. Have a discussion in which everyone gets to tell what they know about the nuts and seeds they are seeing. What are their names? Have you eaten them before? Are there certain dishes they go in or go with? What other seeds and nuts do we eat? (grains, poppy, cashews...)
5. Have a nutty feast.

EXTENSIONS:

- Make nut butter by putting sunflower seeds, almonds or peanuts through a food processor, blender, or food grinder. Usually extra oil is needed.
- Grow sunflowers, pumpkins and other winter squash, then roast the seeds. Put seeds on a pan and place in oven at 300 degrees and roast until brown and crisp. (Don't wash pumpkin or squash seeds before roasting; they'll have a better flavor.)

Sumptuous Seeds

paste
nut
here



Almonds

Some people make nut butter from me. I have lots of calcium so I'm good for bones and teeth. You can buy me roasted, slivered and blanched.



Sesame Seeds

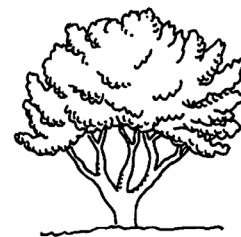
I'm made into oil and used to season foods. You can get me at McDonald's. A lot of vegetarians make sure they eat me so they will get protein and calcium.



Pumpkin Seeds

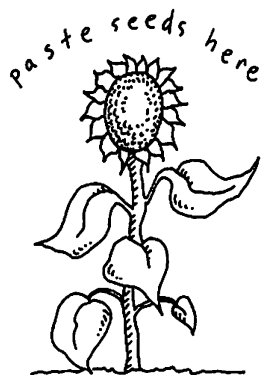
I'm often eaten around Halloween time. I've got lots of calcium in me. You can roast and eat me sometime!

paste nut here



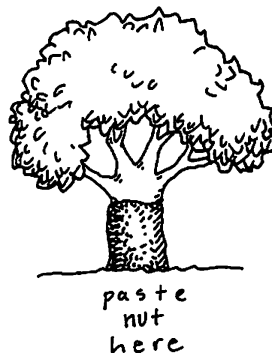
Filbert

You can call me Hazel. I grow on trees that sometimes look like bushes! Sometimes I'm ground up and used to flavor coffee.



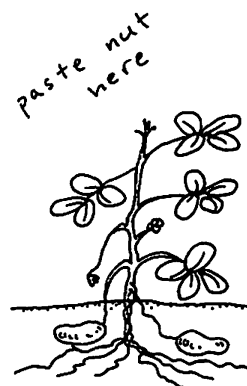
Sunflower Seeds

I'm very nutritious. My plant has a sunny outlook on the world. Birds like me as much as people.



Walnuts

There are lots of my kind of tree growing on roadsides. Some might call me a builders - nut. I am the most commonly used nut for baking.



Peanuts

I grow underground. I love baseball. I'm good spread on celery.

Apples

7 NUTRITION ACTIVITY

Summary:

After a discussion about apples, everyone will get to look at, compare and taste different varieties of apples and some apple products.

Some Helpful Information:

Apples are versatile fruits. They can be eaten raw, which is the best way to get all the nutrition from them. Or apples can be made into sauce, jelly, pie, baked apples, apple butter, vinegar, cider, juice and wine. There are so many varieties of apples it would be difficult to list them all. The apples we find at the grocery stores are typically Golden and Red Delicious, Granny Smith, Pippin, Rome and some more exotic varieties like Fuji. All have unique textures, flavors and colors. A Golden Delicious is not the best for making pie because it has a soft flesh, but a Pippin holds up well, and the sugar added to the pie sweetens up this sometimes tart member of the apple family. Apples have Vitamin C in them. Some varieties have more than others, but all have their vitamins in the flesh close to the skin. That's why it's good to eat your apples skins and all!

If you want to learn about different varieties of apples you can stop at produce stands and see what unique varieties they are selling that may never make it to the grocery store.

Why Do This?

Apples are inexpensive and available all year. There are many varieties that have very different qualities. Firsthand experience will tune members in to the differences and give them a new perspective on apples.



Apples

TIME:

1 hour

MATERIALS:

- A variety of apples, at least two of each. (Write down the names.)
- A variety of apple products and supplies:
 - » applesauce
 - » a paper grocery sack
 - » apple cider
 - » plastic bags
 - » apple butter
 - » spoons
 - » dried apple
 - » peanut butter
 - » apple juice
 - » sunflower seeds or granola
 - » apple jelly
 - » paring knives
 - » baked apple
 - » bowls
 - » raisins
 - » paper cups

PREPARATION:

1. Collect materials.
2. Learn the names of as many different apples as you can find.
3. Try scooping out an apple for the Walking Apple Feast so you can find the best and safest tool to give to your group members.
4. Place all the apple products in the sack.

STEP BY STEP:

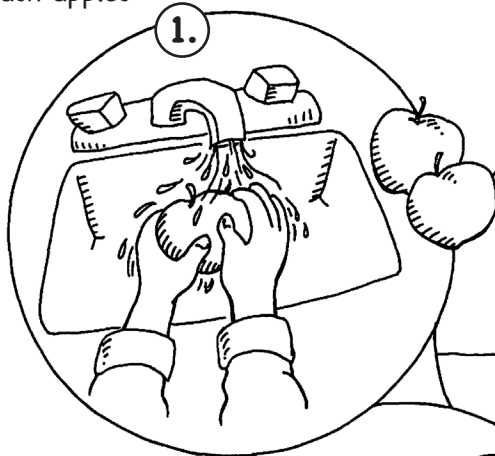
1. In front of everyone cut an apple in half. Dip one cut side in lemon juice, leaving them both open to the air. Ask everyone what they think will happen.
2. Tell them you have some apple products in your sack. Can they name some? As they name them, pull them out of the sack. Pull out and name any they don't guess.
3. Open the products and let everyone take little tastes.
4. Look at the sliced apple. The plain one turned brown because the flesh has reacted with the air. This is called oxidation and is similar to rusting of metal. The lemon juice is acidic and prevents oxidation.
5. Distribute all the different apples. Have everyone compare how they look. Ask if anyone knows the names of the apples they see.
6. Break into groups and make the Walking Apple Feast. Youngsters can mix and fill apples while oldsters cut and scoop out the insides.
7. Don't forget to put the cores in the compost!

EXTENSIONS:

- Take a trip to an apple tree in an orchard or in someone's yard.
- Make applesauce. Core apples and simmer slowly with a little added water. Put through a processor or mash with a potato masher and eat lumpy style.

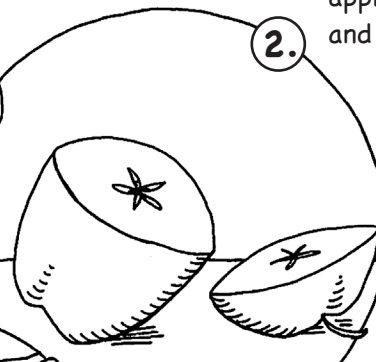
Apples - Walking Apple Feast

Wash apples



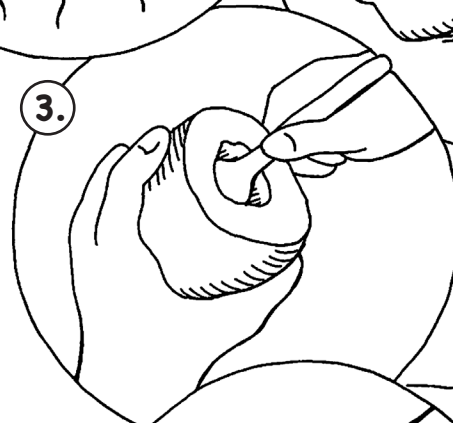
1.

Cut top 1/3 off of apple. Save top and bottom.



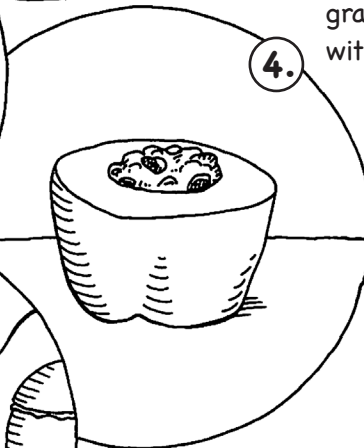
2.

Hollow out the core.



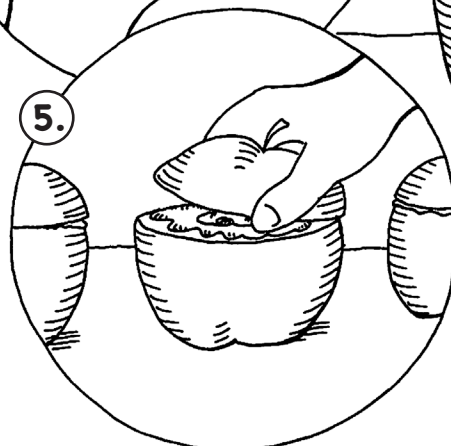
3.

Moosh some peanut butter with raisins and sunflower seeds or granola. Fill the hole with this mixture.



4.

Glue apple top back on with more peanut butter. You can prepare these then store them in a plastic bag for a hiking trip sometime.



5.

Why Do This?

Grains constitute a large portion of our diet. This activity introduces several grains with an emphasis on what wheat is and how it is used.

Wonderful World of Wheat

Summary:

First everyone will examine different types of grains and try to guess which food was made with which grain. A variety of recipes are provided to be prepared as a group and either taken home and cooked or cooked as part of the day's project.

Some Helpful Information:

People eat many different grains. Wheat, corn, oats, rice, barley, millet, triticale, rye, quinoa, and amaranth are some of the grains that are eaten all over the world. These grains are actually the seeds of plants. Inside each seed is all the nutrition needed to start another plant. That means they are nutritious for people too.

The world's cultures have different diets, using a variety of grains in different ways. The corn tortilla is popular in Mexico, while some Asian nations eat rice with every meal. In our western culture wheat has become the grain we utilize most. Each American eats about 130 pounds of wheat every year-enough for about 200 loaves of bread. We use wheat for bread, noodles, cereals, cakes, snacks, and even to feed our livestock. Some folks grow small wheat plants and then extract a green juice, considered very nutritious. Wheat seeds can be sprouted and ground and baked to make a simple dense loaf called wayfarer's or traveler's bread.

Wheat flour is made from ground wheat seeds. The anatomy of the wheat seed helps us understand two different types of flour, white and whole wheat. The seed coat (bran), is rich in B vitamins and trace minerals. The embryo, called the germ, is high in polyunsaturated oil, as well as B vitamins and trace minerals. The endosperm is where all the seed's food is stored, and it is the largest part of the wheat grain. It contains protein, carbohydrates, and iron as well as some B vitamins. The endosperm is what people eat most; it's what white flour is made of. Whole wheat flour is just that-flour made using the whole wheat seed endosperm, bran and germ.

The kind of wheat plant seed is taken from yields different types of flour. For instance, for a good bread flour you need a hard wheat. This variety contains the gluten needed to help a loaf hold its shape. For pastries, cookies and crackers, soft wheat is used. It has a smoother lighter consistency. Specialty foods, like udon noodles or Chinese steam bread are made from mixtures of different wheat types to provide all the right qualities.



Wonderful World of Wheat

TIME:

1+ hour

MATERIALS:

- A variety of grains (Health food stores have bins; you can buy small samples.)
- Small clear containers such as baby food jars or sandwich bags
- Ingredients/materials for the recipe you choose
- A stalk of wheat
- Some whole wheat (often called wheat berries, if not at your grocery store, available at health food stores)
- A blender, food processor or grain mill
- A sampling of foods made from grains such as rice cakes, popcorn, tortillas, bread (whole wheat and white), cookies, oat muffins, udon noodles ... (whatever is available, to show variety)

PREPARATION:

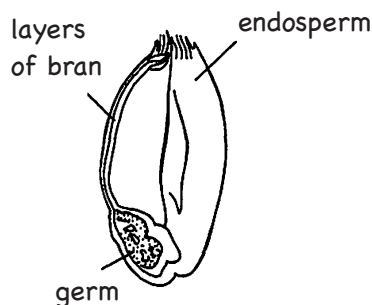
1. Collect materials.
2. Make up packages of sample grains, preferably three per participant. Make sure everyone gets a packet of wheat.
3. You may want to try out the recipes so you know how they turn out and how long they take.

STEP BY STEP:

1. Set out the food samples. Have everyone get three different sample packages of grain-everyone gets wheat.
2. Have them examine their grains and try to figure if the sample foods were made from these grains. (Very young children should be paired with an older person for this step.)
3. Have everyone discuss their grains and the foods.
4. Show them the wheat stalk and the wheat berries. Remove and rub the husks off the wheat seeds.
5. Grind some wheat seeds in the food mill and show everyone the flour that results.
6. Divide into groups and prepare the recipe of choice.

EXTENSIONS:

- Go on a field trip to an ethnic food store and look for food products made from grains.
- Have participants go home and see how many grain products there are in their home. Have them list them and bring the information back to the group.
- Go to the grocery store and see how many kinds of wheat flour there are. Look at some food products and see how many have wheat flour as the first listed ingredient.



Wonderful World of Wheat

Honey Wheat Bag Bread

A very easy option is to use instant soup mixes that have a variety of noodles, grains and seeds in them. Boil water, add mix, and enjoy! Be sure to discuss what ingredients came from wheat and other grains.

WASH HANDS FIRST! THESE FIRST TWO HAVE EVERYONE HANDLING THE FOOD.

Materials (per group of 4):

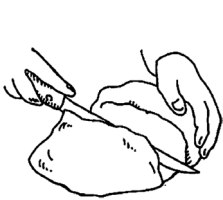
1 two-gallon heavy freezer bag
Measuring cup
Tablespoon
4 Small aluminum loaf pans
Clean surface to knead on
Towel or plastic wrap

Ingredients:

4 cups All-purpose flour
3 $\frac{3}{4}$ cups Whole wheat flour
2 pkg Active dry yeast
2 $\frac{1}{2}$ cups Warm water (105° - 115°F)
 $\frac{1}{4}$ cup Honey
 $\frac{1}{4}$ cup Nonfat dry milk
3 Tbs Oil
1 Tbs Salt

DIRECTIONS:

1. Put these into the plastic bag: 1 cup all-purpose flour, 1 cup warm water, 2 pkgs yeast, 2 tablespoons honey.
2. Seal the bag with as little air inside as possible. Lay it on a table and take turns mixing the ingredients together with fingers.
3. When completely mixed let rest 15 minutes.
4. Add the rest of the water, honey, dry milk, salt and just 2 Tbs oil (1 Tbs oil is for greasing the pans).
5. Work this together in the bag taking turns as before.
6. Gradually add all of the whole wheat flour. Add all-purpose flour until the mixture is stiff and pulls away from the bag. Turn dough out on a floured surface, divide into two balls and continue to knead for 5 minutes. Add more flour if necessary.
7. Cover with plastic or damp towel and let rest 10 minutes.
8. Separate into four equal pieces and shape into a loaf shape (see illustration). Place loaf seam-side down in greased pan. It should rest for about 30 minutes. If the loaf falls before it can be baked, it can be kneaded and shaped again – allow to rise until doubled, then cook.
9. If you have time and an oven, bake the loaves for everyone to take home.
10. Bake 30-35 minutes in a 375° F oven.



Wonderful World of Wheat

Navajo Fry Bread

Materials:

bowl, spoon, measuring spoons,
and measuring cup
electric fry pan or stove access
plate
2 paper towels butter knife

Ingredients:

1 cup flour
 $\frac{1}{2}$ tsp baking powder
 $\frac{1}{2}$ tsp salt
 $\frac{1}{2}$ cup lukewarm water
8 Tbs margarine for frying
honey or jam for spreading on
finished bread

Directions:

1. Combine dry ingredients and mix well.
2. Add the water and mix well.
3. Knead the dough, pushing with the heel of your hand. Dust with flour if it's too sticky.
4. Make little golf balls of dough and pat until it's $\frac{1}{4}$ " thick.
5. Cook in hot margarine (hot, but not smoking). Fry until brown; drain on paper towels.

Simple Noodle Smorgasbord

Materials:

a pot
a hot plate or electric fry pan
colander
measuring spoon
stirring spoon
plates, forks and napkins
can opener* (optional)

Ingredients:

4 - 6 cups water
 $\frac{1}{4}$ tsp salt
2 cups pasta, any kind

Directions:

1. Get water with salt boiling, add pasta and cook until just done (read the package and don't overcook!). Drain the noodles and toss with your choice of toppings:

Simple Garlic Pasta

4 tablespoons butter and 1 teaspoon garlic granules

Clams And Pasta

4 tablespoons butter, small can chopped clams,* 1 teaspoon garlic granules

Macaroni And Cheese

$\frac{1}{2}$ cup cream, 1 cup shredded cheese (cheddar, romano and/or parmesan)

Lemon Spice Pasta

4 tablespoons butter, $\frac{1}{2}$ teaspoon nutmeg, 1 tablespoon lemon juice

Why Do This?

The dehydrated foods the groups will make are nutritious enjoyable snacks. This activity provides group members with one more nutritious way to snack and another way to eat more fruits and vegetables as well as familiarizing them with the dehydration process.

Dry and Delicious

Summary:

Groups will make dehydrated fruit and veggie snacks.

Some Helpful Information:

People have been dehydrating foods since the beginning of time. Dried berries and other fruits and vegetables provided much needed vitamins to people who had no other means to preserve food. We can benefit from dehydrating foods today as well. Dried foods are lightweight, don't take up much room, and require no refrigeration. This means they can be stored well and are ideal as lightweight food to take on hikes or put in lunches. Dried food makes a great every day snack as well.

Dehydrating means to remove the water. We will prepare foods by slicing $\frac{1}{8}$ inch thick slices so they will dry relatively quickly. Vegetables that have a long cooking time like carrots, parsnips, turnips and squash should be blanched. To blanch dunk the cut up vegetables in boiling water for 5 minutes. Blanching reduces spoiling, preserves color and makes produce dry quicker. Vegetables that have a short cooking time like zucchini, beets, cucumber, peppers, onions, mushrooms or tomatoes don't require blanching.

If foods are dried in the oven you need to make sure trays are small enough to allow air circulation and that the temperature never gets above 140 degrees. Temperatures that are too high will destroy nutrients and make the food tough. It is possible to dry foods with the sun, but temperatures need to be consistently above 100 degrees with low humidity. Food must be protected to keep insects off. Take trays in at night. It can take about 4 days to get some foods completely dry. Using a food dehydrator is the easiest. It will hold a constant temperature, and drying time for veggies is about 7-9 hours. Veggies are done when they are tough to brittle. Fruit is done when it is leathery and pliable with no sticky or damp spots.

Dried vegetables are best when used within six months as they become tough with long term storage. Fruit keeps longer but flavor and texture both deteriorate with time. Dried foods can be eaten as a snack. If you want to add vegetables to a recipe you can rehydrate foods. Soak the dried food in an equal amount of water. For example, soak one cup of dried carrots in one cup of water. If you use warm or hot water they will rehydrate more quickly. Don't soak for more than 2 hours or they may spoil. The rehydrated veggies can be served with a sauce or added to a recipe like a soup or sauce.



Dry and Delicious

TIME

1 hour to prepare;

Up to 9 hours in the
dehydrator or oven,

½ hour next meeting

MATERIALS:

First Meeting:

- Fresh firm fruits such as apples, pears, nectarines, persimmons, papaya, bananas, plums
- Fresh veggies such as cucumbers, zucchini, tomato, mushrooms, peppers, beets, parsnips, carrots
- cookie sheets or trays
- Oil or heavy plastic wrap
- Sharp knives and/or food processor with slicing blade
- cutting boards
- Bowls
- Dehydrator or oven
- Masking tape and pen

Next Meeting:

- HOT water for rehydrating
- Cups and forks

PREPARATION:

1. Decide if you will oven dry or use a dehydrator. (The dehydrator will hold at 140 degrees; it may be difficult to keep the oven temperature that low.)
2. Select foods that are ripe but firm enough to slice easily. If using a food processor with slicer, try it out to be sure that fruits make it through the processor slicer without getting pureed.
3. Figure out how much room you have in your oven or dehydrator. You may want to do two batches of dehydrating. Fill an appropriate number of trays. This will determine how much food to buy, how many trays to provide, and how many groups to break into.

STEP BY STEP:

First Meeting:

1. Ask everyone if they were going on a long trip and they had to carry all their fruits and vegetables, how they could do that. Ask if they have eaten dried foods or fruits. Do they know how astronauts and mountain climbers carry their fruits and vegetables? Discuss with them that dehydrating is the removal of water. There is a lot of water in fruits and vegetables. You can bring an instant soup to look at and discuss.
2. Break into groups. Supply each group with a food (or foods) and the materials they need to prepare them.
3. They must all clean, core and/or peel depending on the food they have chosen or been given. Have them slice thin (½ inch) or use food processor to do slicing. Those too young to slice can lay foods out evenly on the trays. Each group should put their name on a piece of tape and put it on their tray(s.)
4. Dry the foods. Bag them or place them in airtight containers with the groups' names fastened to the containers. Bring them to the next group meeting.

Next Meeting:

5. Have everyone find the foods they prepared and taste them. Have everyone taste everyone else's dried foods.
6. Discuss which ones they like the best and why.
7. Try rehydrating some of each type with HOT water and taste test them again. Talk about using some rehydrated foods to cook with.



Dry and Delicious

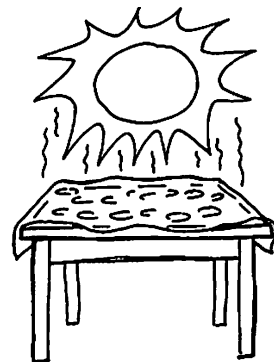
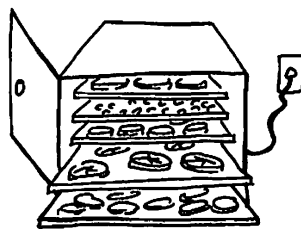
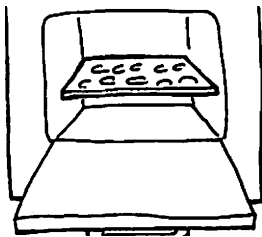
EXTENSIONS:

- Make an instant soup with instant rice, rehydrated veggies and hot bouillon.
- Have everyone think up a way to use the dried or rehydrated food. Have a potluck with their ideas.
- Make fruit leather with applesauce. Spread it ¼ inch deep on thick plastic draped on a tray. Dry in dehydrator following directions or in an oven set as low as possible. Let steam out occasionally and rotate trays. It's done when no longer sticky and will roll up and hold together.

Fruit Leather is a popular dried fruit treat. It requires cooking and more equipment. Food dryers have special trays for fruit leathers. Pour on special plastic tray and dry in dehydrator, following temperature directions provided with machine. If you are drying in an oven you'll need to lay plastic over a cookie sheet and oil the surface of the plastic. Here is a recipe:

FRUIT LEATHER

For each cup of cleaned, peeled and pared fruit (apples, plums, berries, peaches ...) add about one and one-half tablespoons of sugar. The amount of sugar varies with how tart your fruit is and your taste. Cook the fruit and sugar together. Cook just long enough to get the fruit very soft. Puree the mixture. Spread a thin coat on oiled plastic wrap. Be sure it's less than one-quarter inch thick, otherwise it won't dry in the middle. Dry as for dried fruit. Leathers usually take about 3 hours at 135 degrees F. When the surface doesn't feel sticky even when your finger is rubbed over it, leather is done. It will be pliable and a bit stretchy. The finished product can be rolled up on the plastic and refrigerated.



Greens Galore

10 NUTRITION
ACTIVITY

Summary:

Several African greens recipes will be tried so everyone can taste a variety of healthful dishes made from these easy-to-grow, nutritious vegetables.

Some Helpful Information:

Greens are versatile vegetables. They grow well all over the world. They are available all year and are not usually expensive. There are lots of vitamins in greens. They provide fiber in the diet as well. Several varieties of greens are edible raw as well as cooked. These recipes are all African ways of cooking greens and have interesting spices and combinations that are very tasty. Many African recipes call for quite a bit of hot pepper. Where pepper is called for in the recipes included here, it has been reduced substantially.

Why Do This?

Experiencing different recipes
will expose everyone to new
vegetables and ethnic cooking.



Greens Galore

TIME:

1 hour

MATERIALS:

- Electric fry pan (one per group)
- Cutting board (one per group)
- Knives (one per group)
- Measuring cup (one per group)
- Measuring spoons (one per group)
- Forks and cups, or plates for eating/tasting
- Copies of recipes (two per group)
- See recipes for ingredients needed.

PREPARATION:

1. There are four recipes provided. If you have fewer than four groups you can eliminate one recipe.
2. Collect materials.
3. If you are unclear about any of the recipes, try them out at home first.

STEP BY STEP:

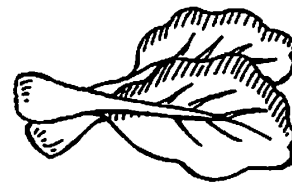
1. Show everyone what greens are.
2. Ask if anyone has eaten them. Ask people to talk about times and ways they have eaten greens.
3. Explain that greens are eaten by most cultures. African cultures are known for their tasty recipes using greens, and the group is going to try a few.
4. Break into groups and distribute materials.
5. Have everyone taste all the recipes they would like.

EXTENSIONS:

- Pick another ethnic group and cook selected recipes for that group.
- Taste each of the greens raw as well as cooked.



kale



bok choy



chard



spinach

Greens Galore

Kale with Coconut Milk

(Kenya, Uganda)

Ingredients:

$\frac{3}{4}$ cup Water
1 lb Fresh kale, cleaned
and chopped
1 medium Onion
3 large Tomatoes
1 cup Canned coconut milk
salt

Directions:

1. Wash kale, trim/tear off bruised spots.
2. Simmer kale in $\frac{3}{4}$ cup water 4-5 minutes.
3. Add onions, tomatoes, milk, and salt. Stir well.
Cook uncovered 20 minutes. Serve hot.

Spinach Stew

(Central African Republic)

Ingredients:

2 small Onions, chopped fine
2 Tbs Oil
2 Tomatoes, chopped
1 Green bell pepper
2 lbs Fresh spinach (or two
packages frozen spinach)
1 tsp Salt
 $\frac{1}{4}$ tsp Cayenne pepper
4 Tbs Peanut butter

Directions:

1. Cook onions until golden in 2 Tbs oil.
2. Stir in tomato and green pepper. Simmer 5 minutes.
3. Thin peanut butter with 2 Tbs warm water.
4. Add all other ingredients. Cook for 10-15 minutes. Add water if necessary
to prevent scorching and sticking.

(This is traditionally served over rice or other cooked grain.)

Recipes adapted from:

Cooking the African Way by Constance Nabwire and Bertha Vining Montgomery, *Lerner Publications, 1988.*

Recipes: African Cooking, *Time Life Books, 1970.*

African News Cookbook African Cooking for Western Kitchens, Ed. Tami Hultman, *African New Service Inc., 1985.*

Greens Galore

Okra and Greens

(Gabon)

Ingredients:

- 1 small Onion, chopped fine
- 2 Tbs Oil
- 1 lb Shredded collards
(or turnip greens)
- 16 Okra
- ½ cup Pine nuts
- ½ tsp Cayenne pepper

Directions:

1. Clean and chop greens.
2. Saute onions until golden in 2 Tbs oil.
3. Add remaining ingredients plus about ¼ cup water.
4. Simmer until nuts and greens are tender, about 20 minutes.

Red Cabbage with Apples

(South Africa)

Ingredients:

- 2 lb Red Cabbage, cored and
shredded thin
- 1 Large Onion, chopped
- ¼ cup Oil
- 2 Tbs Sugar
- ½ cup Water
- 2 Tart Green Apples, cored and
cut into ¼ inch slices
- ½ tsp Nutmeg
- 1 ½ tsp Salt Dash of Pepper
- 2 Tbs (malt) Vinegar

Directions:

1. Pare, clean and chop onion, apple and cabbage.
 2. Saute onion in oil until golden.
 3. Add all other ingredients except vinegar, cover and simmer until
cabbage is cooked.
 4. Add vinegar and cook for a minute or two. Serve hot.
- (Traditionally cooked with bacon and bacon drippings, this recipe is
altered for TWIGS group use.)

MyPlate, My Colorful Plate

11 NUTRITION ACTIVITY

Summary:

This activity will help youth recognize MyPlate and identify it as a guide to healthy eating.

Helpful Information:

The **2015-2020 Dietary Guidelines for Americans** provides science-based advice to promote health and reduce the risk for major chronic diseases through diet and physical activity. According to the Dietary Guidelines, a healthy diet:

- Emphasizes fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products.
- Includes lean meats, poultry, fish, beans, eggs, and nuts; and
- Is low in saturated fats, trans fats, cholesterol, salt, and added sugar.

MyPlate was created to show how to implement the recommendations contained in the Dietary Guidelines. It graphically displays the five food groups that should be the core of a healthy diet. Each of these food groups has a key message to help you improve your diet.

Grains group – Make at least half your grains whole grains. Grains give us energy to work and play. Whole grains provide us with fiber, vitamins, and minerals.

Fruit group – Make half your plate fruits and vegetables. Eat a variety of fruits – whether fresh, frozen, canned, or dried – rather than fruit juice for most of your fruit choices.

Vegetable group – Make half your plate fruits and vegetables. Eat more dark green veggies such as broccoli, kale, and other dark leafy greens, and orange veggies such as carrots, sweet potatoes, pumpkin, and winter squash.

Dairy group – Switch to fat-free or low-fat (1%) milk. Foods in the milk group provide calcium, potassium, vitamin D & protein.

Protein group – Go lean with protein. Choose lean meats and poultry. Bake it, broil it, or grill it. Vary your protein choices with more fish, beans, peas, nuts and seeds.

Why Do This?

MyPlate is a tool to remind us to make healthy food choices and to build a healthy plate at mealtimes. It features the five food groups in proportion to how much we need to eat daily.



MyPlate, My Colorful Plate

TIME:

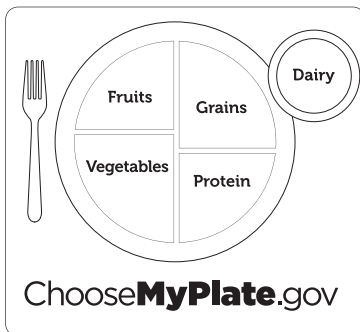
1 hour

MATERIALS:

- MyPlate poster
- MyPlate food pieces
- Picture of a farmer's market

PREPARATION:

1. Gather materials
2. Make copies of "MyPlate" handout

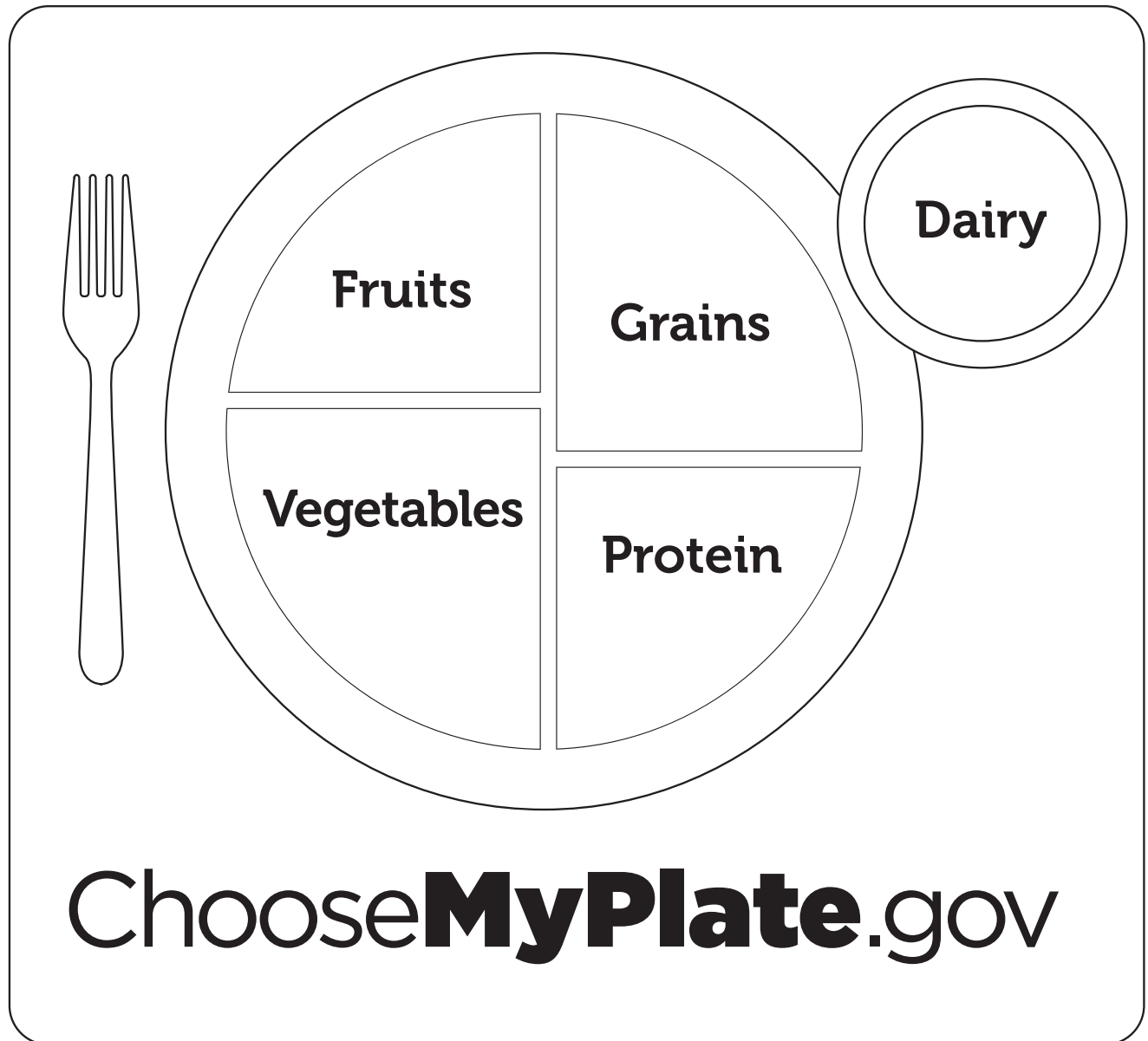


STEP BY STEP:

1. Ask questions to help students understand where food comes from.
 - Have you visited a farm? What kind of food can you find on a farm?
 - Farmers can sell their food to grocery stores or they can take the food to sell at farmers markets. How many of you have been to a farmers' market? What kind of food do you find there? [Show a picture of a farmer's market]
2. Tell the youth that we need to eat right to have a healthy body. Let's talk about how to eat right. Show the MyPlate poster and ask these questions:
 - How many food groups do you see on MyPlate? What are these food groups?
 - Why do we need foods from each food group every day? (*Each food group gives something –nutrients–that your body needs. Eating these foods every day can help make you healthy and strong.*)
 - Can you name some foods that belong in the fruits group? The vegetables group? The grains group? The protein group? The dairy group?
 - Ask each child to select a food piece and place it in the correct group of the poster.
 - MyPlate tells us how much of each food group we should eat. How much of your plate should be fruits and vegetables? (*half of your plate*) Grains? Protein? Dairy?
 - Show students some foods that don't fit in any of the food groups (soda, cookies, ice cream, etc.). Explain these are *sometimes* foods. Place these on left side of poster board.

[For older youth, discuss the key messages from the Dietary Guidelines. Explain concepts such as whole grains, lean meat, fat-free or low-fat, etc.]
3. Pass out the blank MyPlate worksheet and ask students to plan a dinner plate. They have the choice of getting foods from a grocery store or a farmers' market or a vegetable garden.
 - Draw or write the food you select on your plate according to the food group (or use food stickers)
 - How many different colors are on your plate? Who has the most colorful plate?
 - Discuss how eating a variety of colorful food provides vitamins, minerals, and antioxidants to nourish your body.

MyPlate, My Colorful Plate



Sippin' Soda

NUTRITION ACTIVITY 12

Why Do This?

Commercial sodas can be expensive, contain artificial chemicals and often contain as much as 12 teaspoons of sugar.

There are fresh fruit-flavored drinks that make a much healthier beverage.

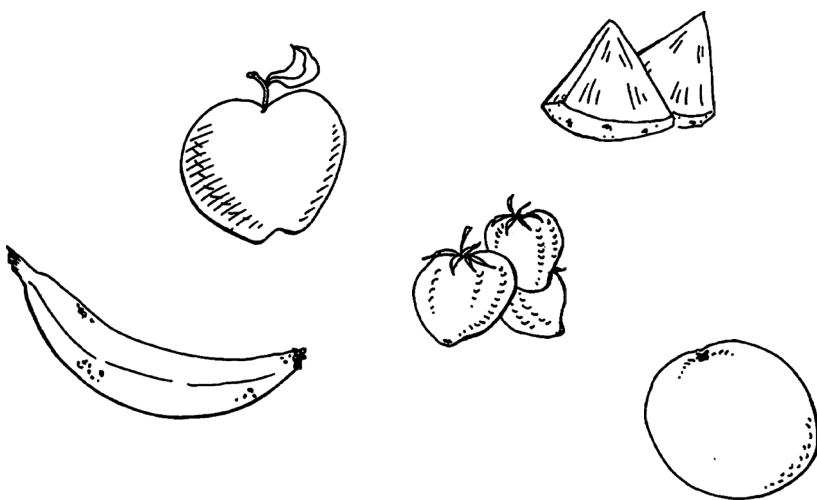
Summary:

Groups make several fruit drinks from scratch. Everyone tastes the drinks and tells how they were made.

Some Helpful Information:

You can make your own healthful beverages at home. Make a batch of one of these and keep it in the fridge. One group of these beverages is called Latino fruit drinks or Liquados. These drinks are available for purchase in Mexican open markets and on street corners. The fruit you choose can be whatever is in season and therefore least expensive.

There are many types of fruit to try besides apples, oranges and bananas. Using new varieties in these recipes will expose your group to some new healthy foods. If the drink is 100% fruit juice, then it counts as part of a fruit group.





Sippin' Soda

TIME:

1 hour

MATERIALS:

- Ingredients for recipes
- 2 Blenders
- Cutting boards
- Small size paper cups
- Towels and sponges for messes
- Knives: a couple of sharp ones are necessary, the rest butter knives
- Bowls to hold fruit in
- Paper and drawing materials

PREPARATION:

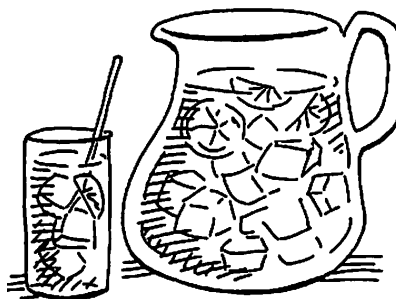
1. Gather materials.
2. If you are unsure of any of the recipes try them at home first.

STEP BY STEP:

1. Break into groups.
2. Distribute a different recipe to each group. Also provide the ingredients they need.
3. Have everyone make their beverage.
4. Have them make a drawing of ingredients and write the name of the beverage on it. Encourage groups to make up a new, more exciting name.
5. Everyone go around and taste the drinks and see what they are made of.
6. If you can do it without hurting feelings, vote on the tastiest concoction.
7. Ask if anyone has a suggestion for another recipe.

EXTENSIONS:

- Bring in fresh orange juice, frozen orange juice, orange soda, and powdered orange drink. Taste and compare each. Talk about the ingredients, calories and nutrition in each.
- Have everyone talk about their favorite drink and how much they drink of it. List drinks in order of how healthy they are.



Sippin' Soda

Lemonade

Ingredients:

- 1 cup fresh squeezed lemon juice
- 2 quarts water
- 2 ½ Tbs honey

Directions:

1. Mix honey and water, stir until dissolved.
2. Squeeze the lemons to make 1 cup of juice, add and stir.

Sangria

Ingredients:

- 1 quart grape juice
- Juice of 2 oranges
- Juice of 1 lemon
- 1 orange, washed then sliced thin
- ½ lemon washed then sliced thin
- 1 quart carbonated water
(club soda, mineral water)

Directions:

1. Mix all ingredients and chill.

Orange Chiller

Ingredients:

- 1 cup nonfat dry milk powder
- 2 cups water
- 1 cup ice
- 1 cup water
- 1 (6 ounce) can of frozen orange juice concentrate
- 1 Tbs sugar

Directions:

1. Mix together well. Should be stirred before serving.

Tropical Smoothie

Ingredients:

- 6 Bananas
- 3 cups Plain Yogurt
- 3 cups Orange or Pineapple Juice
- 10 Ice Cubes
- 1 ½ cup Water
- 2 Tbs Sugar
- 1 ½ cup Fruit (your choice)

Directions:

1. Blend all ingredients together in a blender. You will have to do a couple batches to get it all blended.

Liquado Drinks

Ingredients:

- Choose one:
- ½ watermelon seeded and cut off rind
- 1 cantaloupe
- 2 baskets strawberries
- ½ pineapple

Directions:

1. Blend in blender with 2 cups of water.
 2. Strain then and add to 1 quart water. Serve chilled or over ice.
- (You don't have to strain it, if you don't it's even better for you because you get the fiber.)

Staying Fit with Fiber

13 NUTRITION ACTIVITY

Summary:

This is a food race. Using some clear plastic tubing as intestines, two snack foods will be "eaten." How fast they move through the intestine will be apparent.

Some Helpful Information:

Dietary fiber is the part of food that adds bulk, its non-digestible bits that help keep the "plumbing" of your digestive tract flowing smoothly. Fiber is found in the leaves and stems of vegetables and the pulp and skins of fruits. Fiber is also in beans (the best fiber source), whole grains and foods prepared with whole wheat flour. Getting more fiber in our diet is one of the best ways to prevent cancer of the intestine. Fiber can reduce cholesterol, cleans out the intestine, and prevents constipation as well.

You can get more fiber by eating more fruits and vegetables. Eat whole fruits-juice has the fiber removed. Avoid peeling tomatoes, potatoes and other vegetables and fruits; the skin is fiber-rich and should be eaten. The stems of spinach, broccoli and other vegetables are good to eat, as well as the leaves and flowerets. Whole grain products like oats, brown rice, corn tortillas and whole wheat bread are other good sources of fiber. One great way to get more fiber in your diet is to eat fiber as a snack food. If you select carefully you can eliminate fats too which is good for your health.

Why Do This?

This demonstration will make the value of fiber apparent and is fun besides! Expect this activity to be a little rowdy and a lot of fun!



Staying Fit with Fiber

THE RELAY

In this activity teams feed a snack to their intestine-tube. The snack goes through the intestine (tube) and drops out the end into a bowl. One team member holds the tube over a bowl. Another team member, preferably an adult, "chews" the food by chopping it up into small bits (small enough to push through their tube) with a knife. Keep each food type separate (and the knife away from little ones). The next steps are timed. The first "feeder" stuffs the first food into the mouth of the tube. For half the groups it will be chopped snack cake; for the other groups it will be chopped carrots. They have only 30 seconds to do this! You indicate when the 30 seconds start and stop. The next player steps up to the tube. When everyone is ready you start the timer again. This time the tube mouths are being fed as follows: after cake, chopped candy bar, after the carrots, chopped jicama. Again they have only 30 seconds. The next feeders get 30 seconds to feed either potato chips or the seeds. The last feeder cleans the intestine by "drinking" (pouring through) a drink of water. Any feeder may either push food in with a finger OR squeeze the tube on the outsides (not both). NO team may shake the tube. The groups can compare how much of the snack made it through and how clean the intestine is at the end. If team members who hold the tube over the bowl are all around one table the comparison is obvious.

TIME:

1 hour

MATERIALS:

- A watch with a second hand or stop watch. A whistle is helpful but not necessary.

Per group:

- » 6 inch length of clear plastic tubing approx., 3/4 inch lumen (Optional: get funnels to fit tubing)
- » 1 Sharp knife* (only older participants are to use the knives and only with supervision. There needs to be an adult in each group)
- » Cutting board
- » Bowl
- » 1 Small glass of water

For half of the groups:

- » 1 snack cake with lots of frosting/filling
- » one mini chewy candy bar
- » 1 small bag of potato chips

For the other half of the groups:

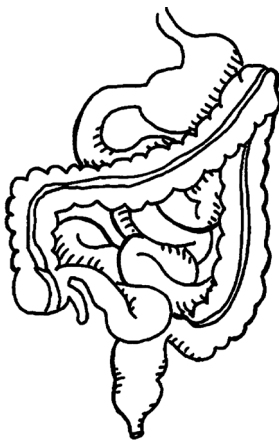
- » 1/2 small carrot
- » 1 small chunk of jicama
- » Tbs of raw sunflower seeds
- Various veggies to nibble and if desired some dips for them. (See recipes that follow.)
- NOTE: If there are not enough adults to chop for each group give the "junk" food feeders a butter knife.



Staying Fit with Fiber

PREPARATION:

1. Purchase tubing at a hardware store and cut into 6 inch lengths. (Optional: find and purchase funnels that fit the tube opening, a snug fit that holds the funnel in place is ideal.)
2. Read the description of the relay in the helpful information section and the step by step procedure a couple times. Visualize where to set up ahead of time.
3. Prepare veggies (and dips) to nibble or bring supplies so youth can cut up veggies and make the dips.



Human digestive tract

STEP BY STEP:

1. Start a discussion by asking if anyone knows what fiber or roughage is? Does anyone know why it is good for them? Hold up the snack cake and the carrot and ask which has more fiber.
2. Using information from the "helpful information section" to talk about fiber and why it is good for us.
3. Divide into groups of 5 or so. Explain the "food race" walking through the procedure once.
4. Assign the knife role and distribute the knives to the adults.
5. Distribute the rest of the materials.
6. Run the relay race! The chewers who chop the food ARE NOT TIMED. No one should feel rushed as they use the knife.
7. Encourage a discussion about the results. Which foods moved through the best? Worst? Why? Why are the foods with fiber good for us?

EXTENSIONS:

- Read the nutrition facts labels and compare the calories in each snack.
- Have groups predict what other foods would do in the intestine tubes.
- Repeat the procedure with light fluffy white bread and with coarse hearty 100% whole wheat bread or multi grain bread.

Staying Fit with Fiber

Some Fiber-Full Nibbles:

Carrots, green pepper, broccoli, tomato, cauliflower, turnip, celery, cucumber, zucchini, jicama, green beans, radishes.

Dip, Dip, Dip those Veggies

REFRIED BEAN DIP

1. Mix about $\frac{1}{4}$ cup cooked or canned pinto beans with $\frac{1}{2}$ teaspoon chili powder.
2. Mash with fork until very soft. If needed, add a little water.

CHEESE 'N CHIVES DIP

1. Mix $\frac{1}{2}$ cup cottage cheese with 1 tablespoon finely chopped chives, thin with 1-2 tablespoons buttermilk and put through the blender.

VEGGIE GARDEN DIP

1. Mix together 1 cup nonfat plain yogurt, $\frac{1}{4}$ cup light mayonnaise, $\frac{1}{4}$ cup finely chopped radishes, $\frac{1}{4}$ cup finely chopped green onion.
2. Add a dash of garlic powder and dried parsley.
3. Chill for one hour.

YOGURT CURRY DIP

1. Mix $\frac{1}{4}$ cup yogurt with $\frac{1}{2}$ teaspoon of curry powder.

Stir Fry Fun

14 NUTRITION ACTIVITY

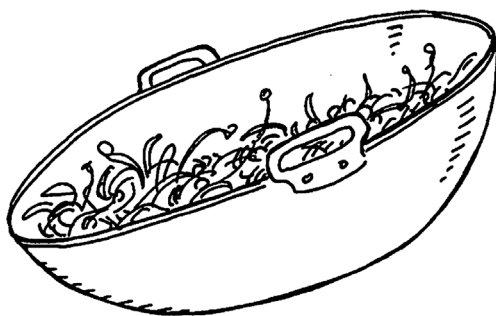
Summary:

The group will prepare a stir fry meal and eat it.

Some Helpful Information:

Stir frying means to cook the ingredients, in this case vegetables, quickly in a small bit of oil, then cover and let steam finish the cooking process. The still crisp and flavorful vegetables are served immediately. Stir frying has become more popular recently. Foods cook quickly, retaining a lot of their nutrients. In parts of east Asia people cook this way to save on precious cooking fuel, which is scarce.

Cooking time is short but preparation is necessary. Cut vegetables into thin and equal thicknesses. Vegetables that take longer to cook are added to the pan first. Those that cook quickly are added later so their total cooking time is less. Heat the pan, add the oil and heat until you can smell it, then add your prepared vegetables. If there is water left on the vegetables, it will cause splattering as it boils in hot oil. Prevent burns by making sure the vegetables are dry before adding them to the hot pan.



Why Do This?

Stir frying is a healthful way to cook. It prevents overcooking which means there are more nutrients left in the food.



Stir Fry Fun

TIME:

1 hour

MATERIALS:

Per group of about five:

- Electric wok or fry pan with lid
- Extension cord, if necessary
- Cooking utensils
- Cutting board
- Pot holders
- Measuring spoons
- Measuring cups
- Soap, Towels and Sponges for clean up

For everyone:

- Plates, forks (chop sticks) and napkins
- Knives: There are durable plastic knives that will cut vegetables and are safer than a sharp metal knife in the hands of young children. It is best to always have adult supervision.
- Ingredients for recipe (see below)

PREPARATION:

1. Think ahead about safety; there will be hot oil and knives around. Don't let anyone trip on an extension cord or spill hot oil!
2. Collect all the materials. If people can bring things from home it may help. Remember to have extras in case someone forgets.
3. You may want to try stir frying at home before leading a group so you are more comfortable with the procedure.
4. Decide if you want to add rice to the menu. If the stir fry is served over rice, it will feed about twice as many people. Don't forget the rice and rice cooking materials if you choose to serve it. You could prepare rice for everyone on a hot plate.

STEP BY STEP:

1. Explain that food often loses nutrients when it is cooked. Vitamins C and B are particularly vulnerable to cooking losses. When vegetables are steamed or boiled there are a lot of vitamins and other nutrients that wind up in the cooking water. It's great to use this liquid for soups, sauces or use to water plants.)
2. Show your group a wok, the traditional pan for stir frying.
3. Distribute materials. Have the groups wash and chop their veggies and then cook their meal.
4. Walk about, helping and answering questions.
5. When everyone is eating, get the group to talk about how well they like the meal. Has anyone eaten or cooked this way before? What other things can be cooked this way?

EXTENSIONS:

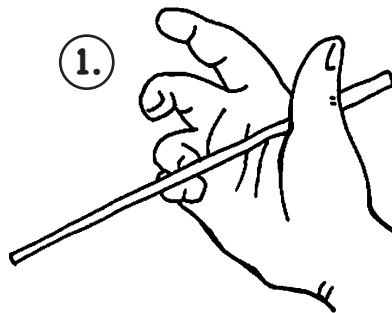
- Get some large format cookbooks from the library that have pictures of stir frying and stir fried foods.
- Go on a field trip to a restaurant that serves stir fry food.
- Have everyone look for different stir fry recipes.

Stir Fry Fun - Using Chopsticks

Think of chopsticks as tongs. One always stays still and the other one moves. Try different ways. Find the one that's easiest for you.

HOW TO USE CHOPSTICKS:

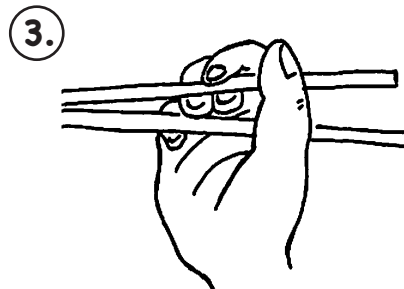
Put one chopstick between your thumb and first finger. Hold it steady with your third and fourth fingers. This chopstick will always stay still.



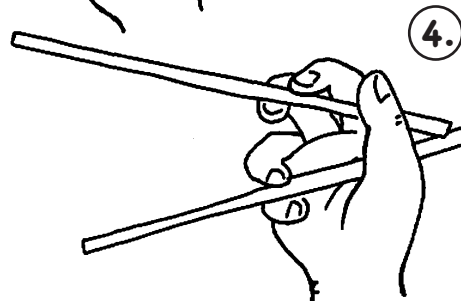
Hold the other chop stick between the tip of your thumb and the ends of your first two fingers. This is the chopstick that moves up and down.



Hold the lower stick steady while you move the upper one. Don't hold the sticks too tightly; a little pressure will do.



Now try to pick up a piece of food using the tips of your chopsticks. It's fun!



Stir Fry Fun

Stir Fry Meal

Ingredients:

1 Tbs Cornstarch
 ½ tsp Ground ginger
 ⅛ tsp Garlic powder
 1 tsp Soy sauce
 ⅓ cup Water
 2 Tbs Oil
 ⅓ cup Carrots, sliced thin
 ⅓ cup celery, sliced thin
 2 cups broccoli, separated
 into flowerets, stems cut thin
 ⅓ cup onions, cut thin
 1 cup bean sprouts

Directions:

1. Mix the cornstarch, ginger, garlic powder, soy sauce and water in a cup and set aside.
2. Clean and cut the veggies. They should be sliced thin and about equal sizes. Be sure they are dry so the oil won't splatter.
3. Heat the frying pan on high. Add oil.
4. When the oil smells hot, add the clean, dry carrots, onions and celery
5. Cook one minute, stirring constantly.
6. Add the broccoli, cook for two minutes. Keep stirring!
7. Add the liquid mixture and cook until bubbly.
8. Add the sprouts and put the lid on the pan. Cook for 2 more minutes.
9. CAREFULLY open lid (keeping face away from steam) serve and EAT! Try using chopsticks.

