Leader's Guide

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4-H Plant Science Unit 2

LANDSCAPE GARDENING

PENNSTATE

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College of Agricultural Sciences
Cooperative Extension

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Welcome to *Landscape Gardening,* the second unit of the Meet the Plants series. This is an Introductory level (11-12 years of age) unit to familiarize youth with some of the more common landscape plants, their care, basic landscape design, and environmental factors.

Landscape Gardening is a six lesson project book which supports the 4-H program. 4-H is an educational program designed to help develop attitudes, values, and skills that will make young people become productive members of society.

The 4-H emblem represents the head, heart, hands, and health which correspond with educational, moral, work, and health ethics. One purpose of 4-H is to provide "hands on" experiences and opportunities to youth for developing their highest potentials in these areas. Specific goals supported by this project are:

1. Developing youth's concern for the society and larger world.

2. Increasing youth's understanding of science and appreciation for nature.

3. Developing good consumer skills.

4. Developing life skills:
   - creative use of leisure time
   - desirable interpersonal relationships
   - leadership
   - responsibility
   - marketable attitudes and skills leading to a career
   - responsible citizenship
   - communication skills

Understanding Youth Needs

In order to fulfill the objectives of the 4-H program, it is important to have an understanding of youths' common needs. These basic needs must be met in order for them to progress to adulthood in a healthy manner. These needs include:

- To experience a satisfactory self-concept
- To experience success in achievement
- To become independent individuals
- To experience adventure
- To develop and accept one's sex role
- To experience acceptance by peers and adults

Although children develop individual personalities, some characteristics are commonly shared by youth 10-12 years old. Leaders should strive to meet these needs in these suggested ways.

Characteristics of Youth:	Implications for Leaders:
• Look to family for approval, but want to be independent of parents.	• Play up successes, minimizing failure.
• Limited ability to make decisions, need freedom to develop own ideas, interests, attitudes	• Encourage less dependence on leaders' decision-making. Avoid dictating direction, yet still provide reassurance and support.
• Need to develop sense of worth and security within own group. High interest in competition and single sex activities.	• Allow for homogeneous groupings, provide outlets for competitive drives.
• Comparison with others difficult to internalize	• Compare work with previous efforts.
• Short interest span; interest in varied active experiences; curiosity in concrete learning.	• Provide educational activities with tangible results. Give short, simple directions, repeat often.

To summarize the key concepts outlined above, when working with youth, remember:
• It is important to continue to play up successes, even small ones, and minimize failures.
• Children like to talk to interesting people who bring things they can SEE and HANDLE.
• This is the age during which children like to explore many areas until skills are found that catch their interest and challenge their ability.
• Children prefer to compare their work with their own previous efforts, not their peers'.
• Evaluation by the individual is desirable. Adults can help determine if improvement is made.
• Adults should be ready to shift the child's life into his/her own hands as soon as they know their ability and willingness to grasp responsibilities.

4-H Educational Experiences

As a leader you can increase and maintain the interest that is raised by allowing members to help plan and conduct community events. 4-H members gain leadership and group skills by participating in making and carrying out plans. Some ideas you can use are:

Family Involvement in a kick-off party for present and prospective members and their parents generates enthusiasm for the new year. Parents' events might include an evening program presented by members, a potluck meeting with a short 4-H program, or a summer family picnic.

Tours and Field Trips are educational as well as recreational if planned ahead of time.

Demonstrations at local meetings are good preparation for a similar county-wide event. Have youth give demonstrations to community organizations including nursery and garden clubs, parent-teacher associations and service groups, and to nursing and retirement homes.

Decision-Making and Judging begin by making choices between two or more things and being able to explain the reasons for these choices. Making decisions based on standards of quality is a very useful skill. You can teach these standards by providing opportunities for youth to choose and compare products and plant materials and having them discuss, compare, and contrast the strong and weak points of each. Contact your county extension office for publications such as the 4-H Manuals for Flower and Vegetable Judging.

Discussions and Problem-Solving are an effective way for youth to teach themselves different subjects, to gather experience in presenting their views and opinions to a group, and to learn the art of active listening. As a leader, you can stimulate thinking and problem-solving abilities through many of the hands-on activities. You can also generate discussions by planning thoughtful and thought-provoking questions to youth.

Exhibits used at local events for parents, friends, and community members are an excellent way to recognize these youth and to promote the 4-H program you conduct.

Community Service is an integral part of 4-H. Sharing with others allows youth to practice leadership and communication skills, develop commitment to the community and its needs, and also encourages family involvement. This sharing spirit will contribute to youth's sense of membership in the community. Your telephone directory's guide to human services can be consulted for listings of agencies and centers that might appreciate your group's contribution. Such activities might include giving presentations to a health-care facility, senior citizen's group, making an audio tape for the blind, or having youth identify activities where they can become involved.

How to Use This Guide

This manual provides additional information to complement the member's guide. You are encouraged to *expand, rearrange, and provide innovative lessons* to meet the needs of your group, whether it is a community or project club or school enrichment program.

The leader's guide is divided into sections that will help you organize a meeting or lesson on each of the six topics in the member's guide. Each topic in this guide has five major parts:

I. Topic Introduction
II. Purpose and objectives
III. Teaching aids
IV. Procedures
V. Looking ahead

More information regarding project resources, materials, and 4-H events may be found in the *Meet The Plants* leader's guide.

Landscape Gardening, the second unit of the Plant Science series, incorporates the use of the Scientific Method into the experiments these members should complete. The Scientific Method should be explained each time they conduct the Experiments in Lessons 3, 4, and 5. After one or two experiments have been completed, these members may be able to repeat the steps of the Scientific Method without you explaining it again. Upon completion of each experiment, have members match steps of the experiment to the steps in the Scientific Method.

Each step of the Scientific Method is shown below accompanied by a brief explanation.

1. **Formulate a hypothesis**—Put forth an idea or proposal about something that interests the researcher or the researcher believes to be factual. An example is "A seed will sprout more quickly at 85° than at 65°."
2. **Design an experiment**—Construct a real-life simulation that will prove or disprove the hypothesis. The researcher designs an experiment which will test the hypothesis. This step involves the use of deductive reasoning—using general facts or knowledge to arrive at specific instances or facts. In the case of this hypothesis, the researcher knows plants generally grow more quickly at 85° than at 65° and, therefore, seeds should also sprout more quickly. The researcher sprouts two sets (replications) of five bean seeds in paper towels kept constantly moist at the two temperatures (85° and 65°) which are kept constant.
3. **Collect data**—scientific information is gathered to support or deny the hypothesis the researcher formulated. Recording periodic observations from the experiment provide the evidence and facts.
4. **Draw conclusions**—based upon the evidence and facts which have been gathered, the researcher concludes whether their hypothesis has been proven or disproven.

Lesson 1. INTRODUCTION TO LANDSCAPE GARDENING

I. Topic introduction

Plants are used to make our homes and public areas more attractive, comfortable, and usable. They can be used to screen unwanted sights and sounds, or to accent and highlight areas that we want to be noticed. A wide variety of plants can be used in a landscape scheme. Flowers, trees, vines, and lawns are all part of a well designed landscape.

Part of learning about landscape design is being able to select, design, and landscape a small area around a mailbox, entryway, or small corner of the yard. Selection of the proper plant material is also important in the overall design. Knowing when and how often a plant flowers, and what it's growth cycle is helps us to determine how to use it in the landscape.

Gardeners group plants in ways that refer to their life cycles, uses, and growth habits. A plant's life cycle is the period of time that it takes to grow from a seed, produce flowers and seeds, and then die. Annual plants do all this in one year, while biennial plants take two years. Perennial plants grow from a seed and produce flowers and seeds for many years. Some perennials native to warm regions are treated as annuals because they are sensitive to low temperatures, dying off after a frost. Other perennials are resistant to low temperatures and survive for many years. Plants are also called woody or non-woody based upon how soft or hard their stems are. Almost all annuals, biennials, and some perennials are considered non-woody since they have soft stems. Trees and shrubs are woody plants.

II. Purposes and objectives

The youth will be able to:

- identify differences in annual, biennial, and perennial plants
- describe how to read a seed package
- demonstrate decision making skills while selecting annual flowers

III. Teaching aids

Materials each member will need:

ACTIVITY 1. "Understanding Your Seed's Needs"—Write a Letter or Go On A Field Trip

See Member's Guide

You may want to have a few old seed catalogs on hand.

If a fieldtrip isn't practical, bring samples of annual flower seed packets to the meeting. The members could do the second half of this activity by identifying plants in their home or school landscape that fit into each category. They could then look the plants up in a reference book to determine their botanical names and into which life cycle group they fit.

IV. Procedures

ACTIVITY 1. Write a Letter

You might begin by showing the members some pictures of flowers from the old seed catalogs. Ask them if they ever thought about growing flowers as pretty and colorful as the the ones that you show them. (You even could show them actual cut flowers if in season.) Tell them that before they complete their project in *Landscape Gardening* they will be able to grow some flowers.

Ask the members to let you proofread their letters before they send them. Be sure that they include their return addresses in the letters. Learning to write and asking for information are two of the important life skills that members can gain.

"Understanding Your Seed's Needs"—Fieldtrip

This fieldtrip really has two different parts to it. Most seed packets contain the information that is needed to successfully germinate the seed. By learning to read the package and use the information that is given, the members should develop more self-reliance to seek out and use information on their own.

The second part of this activity should take approximately 1 hour to complete. They should need approximately 4-5 minutes for each plant they identify. This is an opportunity for group activity as well as for each individual to select a certain number of plants they individually like. This activity is also ideal for generating discussion and problem-solving if you prepare questions ahead of time.

A few examples of questions for discussion might be: "Why did you prefer one plant more than another?" "If you had a choice between . . . (list 3-4 different plants), which plant would you select 1st, 2nd, and so on? Why?" Questions of this type help youth formulate and put forth an opinion based upon reasons they have thought about.

Before you make the fieldtrip, you should contact the manager or owner of the business at least one week in advance to obtain permission and get their assistance. The members may elect to visit more than one store with their parents or friends. This will give them more of a variety of experiences.

Introduce the manager or owner (if possible) and have them show and tell the 4-Hers about the business. This may provide the members with an opportunity to explore a potential career. If there is time, have each member introduce him/herself to the manager. This is a good opportunity for encouraging the development of life skills such as interpersonal skills and communication skills.

V. Looking ahead (to Lesson 2. Landscape Design)

In Lesson 2 the members will begin to look at the landscapes around their homes and schools differently. You may want to acquire some graph paper for the members to use when drawing their plans. The Member's Guide contains a sheet of 1 inch x 1 inch graph paper for them to use.

Lesson 2. LANDSCAPE DESIGN

I. Topic Introduction

The ultimate product of the landscape gardening project should be a small flower bed designed and planted by each member. In Lesson 2 there are three major concepts of landscape planning that will be discussed. They are: (1) flower bed location, (2) use of color, and (3) planning for flower height.

There are many areas around a home or school that are suitable for flower beds. Annual flowers may be planted along driveways, walks, terraces, and fences, or in front of permanent foundation plantings such as trees and shrubs. The area around a mailbox or lamp post is also a good area in which a 4-H member can plant a flower bed. Discourage them from planting a flower bed in the middle of a lawn. First of all, this presents a challenge to the person who has to mow the grass. Secondly, it will be difficult to prepare the soil for flowers. The bordering areas of home or school landscapes are best choices for first time landscapers.

The use of color in planning which flowers to plant is a matter of individual taste. It is best, when starting out, if the youngsters try to use colors that are similar. As they become more experienced, they may want to experiment with different color combinations. The color wheel in the Member's Guide will give the members some help in choosing the colors of their flowers.

The principle of planning for flower height is simple. If a tall flower is planted in front of a short flower, the short flower will not be visible. This is especially important to keep in mind when planting flowers in front of buildings, fences, or walls that will only be seen from one side. If the flower bed can be viewed from several sides, you should locate taller flowers in the center of the bed, and work your way out to the edge with the shortest flowers being around the outside of the bed.

II. Purposes and Objectives

The youth will be able to:

- identify three potential landscape sites around their home
- draw three identified landscape sites on graph paper
- discuss how to locate flowers in a bed by height

III. Teaching Aids

ACTIVITY 1. Selecting a Site

See Member's Guide page 5 for a list of required materials and a newsprint pad and marker, or chalkboard and chalk.

IV. Procedures

ACTIVITY 1. Selecting a Site

To illustrate how to measure and draw the three selected sites, have the members help you measure and draw (on newsprint or chalkboard) the room in which you are meeting. Similar to a landscape drawing, be sure to include walls and other large objects that are in your meeting room (landscape). You can use desks or tables to simulate fences or sidewalks, and chairs to act as trees and shrubs. A little creativity here should be fun for kids and will also show them how to measure and draw their landscape sites. It may be helpful for the members to work in pairs or get assistance from their parents.

They will be using the worksheet on page 6 throughout *Landscape Gardening*. There are some blanks to be filled in when they complete activities in later units. Encourage them to keep their drawings and worksheet in a safe location because they will use them later as they proceed through *Landscape Gardening*.

V. Looking Ahead (to Lesson 3. Light and Temperature)

You will need to decide in advance if you want to do EXPERIMENT 1. Light for Green Growth as a class or if you want each student to do the experiments on their own.

Lesson 3. Light and Temperature

I. Topic Introduction

In the next three lessons the members will be learning about the environmental requirements of landscape plants. Light and temperature are presented in Lesson 3, water is the topic of Lesson 4, and soils and nutrients are the focus of Lesson 5.

Energy, in the form of light from the sun, is one of the driving forces in the chemical process known as photosynthesis. You should allow time during the lesson to show and explain the process (as shown below) on a chalkboard or newsprint pad. For a more detailed discussion, you may refer to the references outlined in the Leader's Guide for *Meet the Plants*.

CO_2	$+ H_2O$	+ LIGHT	produces	$C_6H_{12}O_6$	$+ O_2$	$+ H_2O$
carbon dioxide	+ water	+sun	produces	sugar	+ oxygen	+ water

or like this:

carbon dioxide (from the air) **plus water and nutrients** (from the soil)
plus
chlorophyll (green pigment in leaves) **plus energy** (light from the sun)

---

sugar + water vapor + oxygen

It is important to point out to the members that if the plant has too much or too little of any one of these elements —carbon dioxide, water, or light—photosynthesis will be slowed down or completely stopped. This can cause the plant to stop growing and die, or to be weakened enough to be subject to diseases and insect attack. This concept can be compared to how well humans take care of their bodies. We need to get enough rest, proper nutrition, and exercise to remain healthy.

In *Landscape Gardening* we will concern ourselves with the amount and intensity of sunlight that different areas receive during the day. The members will be doing activities designed to find out if their three landscape sites receive full sun, full shade, or partial shade. There is no hard and fast rule to apply when determining the amount of sunlight an area receives. If an area receives direct sunlight for six or more hours each day, you should consider it to be a full sun site. Areas that receive little or no direct sunlight (such as areas shaded by trees, walls, or buildings) are full shade sites. An area that receives some direct sunlight during part of the day is a partial shade area. Almost all annual flowers will do quite well in full sun areas.

II. Purposes and objectives

The youth will be able to:

- identify and discuss full sun, full shade, and partial shade conditions
- describe what happens to plants that do not get sunlight
- identify the temperature zone in which they live

III. Teaching aids

EXPERIMENT 1. Light for Green Growth
See member's guide page 9 for a list of required materials.

ACTIVITY 1. I See the Light
See member's guide page 10 for a list of required materials.

ACTIVITY 2. The Temperate Zone

See member's guide page 11 for a list of required materials.

IV. Procedures

EXPERIMENT 1. Light for Green Growth

In this experiment, the 4-Hers should use the four steps of the Scientific Method. Take a few minutes to explain the four steps that are involved in the Scientific Method. Be sure to include specific examples of each of the four steps.

Ask them to formulate the hypothesis for this experiment by asking the question, "What will we try to prove in this experiment?" (Hypothesis: Plants that don't receive light will lose their green color.) The explanation of the importance of light to plants should be brought into the formulation of the hypothesis. In this instance, you may have to guide them into stating the correct hypothesis until they become more skilled at this concept.

The second step of the Scientific Method, designing the experiment, has already been completed.

Collecting data is the third step of the Scientific Method. This is why there are spaces for the members to fill in at the bottom of the page.

The final step is for them to draw conclusions based upon their observations. At the conclusion of the experiment, each member should share their results with others in a short presentation or demonstration. In the discussion, be sure to compare and contrast their observations with those of other members.

ACTIVITY 1. I See the Light

As the 4-H members try to decide which site they will actually use for their landscapes, they need to consider the amount of sunlight each of the sites receives. They will eventually have to use this information when they select the site that they are going to use.

An important part of the scientific method is observation. In this activity, observing the three sites at different times of the day is how the students will gather their information about sunlight.

A full sun site requires that 3 of 4 observations be full sun. A full shade site has no full sun observations. All other combinations are partial shade.

ACTIVITY 2. The Temperate Zone

Recently, there have been studies published that said American school children could not locate places on a map. This will help the children become more geographically literate.

The hardiness zone map is to be used as a guide only to determine which biennial and perennial plants can be successfully grown in their areas. For more accurate dates, contact your local county Extension office or an experienced gardener in your community.

V. Looking ahead (to Lesson 4. WATER FOR LANDSCAPE GARDENING)

Inform as many different people as possible, including the members, about collecting tin cans for the rain gauge activity in Lesson 4. If you are really creative, you might consider getting some paint or contact paper the members can use to decorate their rain gauges.

Lesson 4. WATER FOR LANDSCAPE GARDENING

I. Topic introduction

Water is a major component of all living plant cells. The amount varies from 3% in shelled peanut seeds to 40% in dormant wood, and up to 95% in succulent fruits like watermelon. Water is the medium by which everything is transferred within a plant. Water also maintains the pressure or turgor inside a plant to keep it upright and growing.

The loss of an excess amount of water results in the plant stopping growth and its eventual death. This may occur quite rapidly under hot, dry conditions in plants that are not structurally adapted to prevent water loss. Most landscape plants that we might be using are usually not adapted to these conditions because of their original natural habitat.

The amount of moisture in the soil that is beneficial to plants has definite limits. Too much water is not toxic itself, rather it is the lack of oxygen in waterlogged soils that causes damage. That is why it is important to have soils that drain well and to not overwater plants in the landscape.

II. Purposes and objectives

The youth will be able to:

- describe what happens to seeds that don't get enough water
- measure and record rainfall
- explain the transpiration process
- determine the water needs for their three landscape sites

III. Teaching Aids

EXPERIMENT 1. Sprouting Seeds

See member's guide page 13 for a list of required materials.

ACTIVITY 1. Let's Measure The Rainfall

See member's guide page 14 for a list of required materials.

ACTIVITY 2. How Dry I Am

See member's guide page 15 for a list of required materials.

IV. Procedures

EXPERIMENT 1. Sprouting Seeds

Each member should develop a hypothesis that they will be testing with this experiment. (Hypothesis: The amount of moisture present will affect the germination of seeds) The plate with no water is called the control group. This is used to compare against the other two plates (experimental groups). Be sure to have the members discuss their findings. Have them note what happened to the seeds that were soaking in water compared to the ones in the moist paper towels. Is too much water just as bad as not enough water?

ACTIVITY 1. Let's Measure the Rainfall

This will provide your members with a handy device to measure how much rainfall they get in their three landscape sites. Depending upon wind direction, permanent structures, trees, etc., different landscape sites may receive different rainfall. They can also use this to check the amount of water that they apply when they do need to water. You should emphasize that part of scientific method is to make observations (regular checking of the rain gauge) and make decisions based on those observations (how much to water).

ACTIVITY 2. How Dry I Am

This activity will involve the members in making more observations. The first part of this activity will be completed when they can calculate an average rainfall total for each site. You may want to show them the differences between wet, moist, and dry soil. A good rule of thumb to apply is:

wet	The soil forms into a ball or long ribbons when squeezed.
moist	The soil crumbles and small pieces stick together when squeezed.
dry	The soil appears to have no moisture at all, and when squeezed will not stay together.

V. Looking ahead (to Lesson 5. Soils and Nutrients)

You and the members will need to start gathering containers for use in the activities and experiments in this lesson. For Activity 1: Sudsy Soil Separator you will need to decide if you want each student to do the experiment or if you want it done in small groups. It will take the appropriate number of glass jars with lids depending on your decision. You will have a similar decision to make for Experiment 1: More Isn't Always Better. Do you want your members to do the experiment in groups or individually? This will take some advance planning.

Lesson 5. SOILS AND NUTRIENTS

I. Topic introduction

Of all the many aspects of gardening, an understanding of your soil is probably the most important.

Soil is a mass of mineral particles mixed with living and dead organic matter and it incorporates quantities of air and water. Clay is composed of very small particles. Small, disk-like particles of clay fit closely together with little air space between them. When clay soils get wet, they dry out slowly because downward movement of water (drainage) is slow. Since air content is limited, root growth is inhibited.

Sandy soils have comparatively large particles which permit good aeration, very quick drainage of water, and quick warming. Plants in sandy soils require more frequent watering. Silt is a medium sized particle. The amount of sand, silt, and clay in a soil is referred to as texture. There are many combinations of the three particles that result in several kinds of textures.

Both sandy and clay soils can be improved by the addition of materials that have the capacity to hold both air and water. Organic matter, such as animal manure, peat moss, and compost, can be used to loosen clay soils and bind sandy soils. The spaces between the soil particles are called pore spaces. Pore space can be illustrated by comparing a screen with nylon stockings. The screen will represent the large pore spaces in sandy soil, and the nylon represents clay soil with small pore spaces. If you dip each in water you can get a pretty good idea of the differences in the two as to how they hold water.

Materials that supply nutrient elements to plants are known as fertilizers. The primary objective of fertilization, the addition of nutrients to the soil, is to achieve an optimum plant response. This means the production of leaves for foliage and flowers for flowering plants.

Fertilizers that supply nitrogen (N), phosphorus (P), and potassium (K), the three major plant nutrients, are called complete fertilizers. The fertilizer analysis is the percentage of nitrogen, phosphorus, and potassium respectively. So, a 10-10-10 analysis fertilizer contains 10% nitrogen, 10% phosphorus, and 10% potassium. That means that in a 100 pound bag of fertilizer, 30 pounds would be nutrients and the other 70 pounds would be inert matter or filler. The fertilizer analysis is found on all commercially available fertilizers.

One way that you can illustrate this concept to the members is to put 100 pennies on the table to represent a 100 pound bag of fertilizer. Then, separate the pennies into four different stacks. Three of the stacks would contain 10 pennies each, to represent the 10% nitrogen, 10% phosphorus, and 10% potassium. The fourth stack would have 70 pennies to represent the remaining contents of the fertilizer bag. Since we are dealing with straight percentages, this example will work for any fertilizer analysis (15-15-15, 5-10-5, etc). You could also use items that have different colors like beans, M & M's, jelly beans, or aquarium gravel.

A plant's response to fertilization is related in part to the environmental factors such as light, temperature, and water, discussed in previous lessons. A plant requires a favorable environment for all of its parts--roots, leaves, and stems. Generally, nitrogen is responsible for the dark gree color of a plant's foliage or leaves. Phosphorus is required for the production of flowers, and potassium is necessary for strong and vigorous root growth.

II. Purposes and objectives

The youth will be able to:

- list the three types of soil particles
- describe the texture of soil from their yard
- explain the purpose of fertilizers
- describe what happens when different amounts of fertilizer are used

III. Teaching aids

EXPERIMENT 1. Sudsy Soil Separator

See member's guide page 17 for a list of required materials.

ACTIVITY 1. Soil Textures

See member's guide page 17 for a list of required materials.

ACTIVITY 2. What's Your Type?

See member's guide page 18 for a list of required materials.
If you decide to do this as a group, you will need to collect some soil samples prior to the meeting so that everyone will have a chance to participate. If this activity is done indoors, it would be advisable to have newspapers that can be spread out to avoid making a mess.

EXPERIMENT 2. More Isn't Always Better

See member's guide page 20 for a list of required materials.
If you are in a school setting, you may want to divide the members into teams and have each team do an experimental plot in the school yard (with the principal's permission of course).

IV. Procedures

EXPERIMENT 1. Sudsy Soil Separator

The soil used in this experiment may come from one of the sites members are studying. After they have read about the different soil particle sizes, this activity should provide a good illustration to show that most soils are made up of all three soil particle sizes and not just one. With this activity you can also work with them on math skills. The member's guide calls for measurements in inches. If you feel comfortable with it, you may want to consider using centimeters (metric measurements) as well.

You can also encourage them to calculate the actual percentages of sand, silt, and clay that are present. This is simply done by dividing the total inches of soil into each measurement for sand, silt, and clay. For example, if you have 5 3/4 total inches of soil, and 2 inches of that total are sand, then the percentage of sand in the soil sample is calculated by taking 2 and dividing it by 5.75, which equals 35%. The percentages of silt and clay would be calculated in the same manner.

The largest soil particle sand, will be at the bottom of the container since it is the heaviest. The next layer will be silt and the top layer will be clay. Have members speculate or hypothesize how these layers will appear also.

ACTIVITY 1. Soil Textures

This activity is designed to introduce the three textures of the soil. Using substances from the house allows for the 4-H members to relate soil texture to something familiar. You may wish to use sand instead of sugar or salt. It may take some movement back and forth between the household items and the actual soil before you or your members can distinguish the type of soil that you have. We will apply what we learn here in Activity 2.

ACTIVITY 2. What's Your Type?

Now that the members have had a chance to see the soil separated and feel substances similar to the soil particles, they will now attempt to determine the type of soil that is present in each of their three sites. This is a good activity to encourage discussion between the members. After they have made their decisions, have them pair up and explain to their partner why they decided on their three choices. They can then check each other's soil samples to see if there is agreement or not.

EXPERIMENT 2. More Isn't Always Better
This an experiment that you may want to do as a group. The important concepts to teach here are (1) the members should predict what will happen to each area of grass, and (2) they should compare the actual results to their predictions. Have them give oral reports about what happened to the plants. It is critical that they realize adding more fertilizer doesn't always make a plant grow any better.

V. Looking ahead (to Lesson 6. Planting and Care of the Landscape)

Although this is the sixth and last lesson in *Landscape Gardening*, it provides many opportunities for the 4-H members to exhibit what they have learned. There are several activities that can be completed during the last meeting.

Lesson 6. PLANTING AND CARE OF THE LANDSCAPE

I. Topic introduction

This lesson is designed to tie together everything the members have learned in Lessons 1-5. They will be finalizing their landscape plans by selecting their sites, drawing a plot plan, preparing the soil, selecting transplants, and planting their flower beds. They will also be learning a few of the basic principles of landscape plant care.

II. Purposes and Objectives

The youth will be able to:

- demonstrate decision making skills by selecting a site in which to locate a flower bed
- explain and demonstrate how to prepare the soil for planting
- identify the characteristics of good transplants
- list the methods of preventing disease and pest problems

III. Teaching aids

ACTIVITY 1. Final Site Selection

See member's guide page 21 for a list of required materials.

ACTIVITY 2. Site Plan

See member's guide page 22 for a list of required materials.

ACTIVITY 3. "The Ace of Spades"

See member's guide page 24 for a list of required materials.

ACTIVITY 4. The Transplant Doctor

See member's guide page 25 for a list of required materials.

ACTIVITY 5. Landscape Gardening Word Search

No extra materials are needed. Here are the terms that are used in the word search:

LANDSCAPE GARDENING	TREES	SHRUBS
SEEDS	ANNUAL	BIENNIAL
PERENNIAL	LIFE CYCLE	WOODY
NON WOODY	GROUNDCOVER	CHLOROPHYLL
PHOTOSYNTHESIS	FULL SUN	FULL SHADE
PARTIAL SHADE	HARDY	HALF HARDY
TENDER	CLAY	LOAM
SAND	SILT	TEXTURE
NITROGEN	PHOSPHORUS	POTASSIUM
FERTILIZER	ORGANIC MATTER	GERMINATION
TRANSPIRATION	WILT	COLOR WHEEL
TRANSPLANTS	PINCHING	WATER
STAKING	GROOMING	SPADING
RAKING	SMOOTHING	4H IS FUN

Record and Review

It is very important for the members to complete this activity as it will provide them with an opportunity to think about and reflect on the *knowledge* and *skills* they have just learned. Each of the nine questions covers a particularly important topic within a lesson and there is more than one right answer.

When evaluating a young person's written responses to each of these questions, carefully consider their basic understanding of the concept discussed. The major concepts presented in Landscape Gardening parallel each of the headings of the six lessons.

Sharing With Others and Round-Up Projects

Many different examples of activities to do in small groups, pairs, or individually appear in these two lists. Any of these activities can provide you the opportunity to assess and evaluate the knowledge and skills that have been learned.