HABITAT Urban Gardens

HUG is an educational and cooperative program involving HABITAT for Humanity, homeowners and Master Gardeners

The University of Tennessee
HUG Mission:
To educate and assist HABITAT for Humanity homeowners in the landscaping of their new homes using donated plants, materials and Best Management Practices.

HUG is an educational and cooperative program involving HABITAT for Humanity, homeowners and Master Gardeners.

The HUG process includes five steps:
1.) Teaching
2.) Landscape Planning
3.) Gathering Landscaping Materials
4.) Installing the Landscape
5.) Follow-up

provided by a partnership:
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Homeowners Landscape Handbook

This handbook offers the homeowner a source of landscaping information to improve landscaping skills and stimulate enjoyment of plants around the house and yard.

This handbook is for both individual and group instruction and may be used as a reference for planning a landscape, planting and maintaining a landscape, for home study and as a resource guide.

The lessons in this handbook should offer instructional, interactive, basic and useful landscape information. A Master Gardener will demonstrate important aspects of each lesson in the handbook.

Master Gardeners will serve as the resources to Habitat and homeowners throughout the HUG process.

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The HUG Program is a partnership of HUG volunteers and Habitat for Humanity. Master Gardeners and other volunteers will help you design and landscape your yard. You have agreed to participate in at least six hours of instruction, assist other homeowners in installing their landscapes, assist in planning your landscape, assist in installing your landscape and participate in follow-up instruction. Volunteers will visit your home to assist you. You will be expected to do your share of the physical work when it is time to plant.

This handbook belongs to:

Name(s): ____________________________________________
Address: ___________________________________________
__________________________________________________
Phone: _____________________________________________
Scheduled Planting Date: _____________________________

HUG Contact Information:

HUG classroom location: _____________________________
HABITAT office phone: ______________________________
HUG volunteer contact: _____________________________
Phone: ____________________________________________
Activity Descriptions:

1. **Instruction** – Attend at least three 2-hour classes: basic soil and plant science, landscape design and plant varieties and types; create a 5-year plan; (HABITAT and Master Gardeners will plan, host and coordinate)

2. **Landscape planning** – Master Gardeners meet with you on-site to plan and discuss landscape design and make a plant list and address other needs;

3. **Landscape planting** – You and the Master Gardeners will arrange date, time, work crew, tools, supplies, plants, soil, mulch and other items; participate in the landscape planting process;

4. **Follow-up** – A Master Gardener will contact you to follow-up on any landscape maintenance problems and questions.

*NOTE: The six-month cycles are identical. The activity timeline numbers above correspond to the activity description numbers.*
Plants Need PLANTS

Introduction Just like people, plants need basic things in their environment to grow and be healthy. Each letter in the word PLANTS points out an essential growth need for all plants. In this lesson you will learn:

**P** = place to grow

**L** = light

**A** = air

**N** = nutrients

**T** = thirst/water

**S** = soil

Plants need PLANTS to grow in the landscape.

**P** The “P” in plants stands for a place to grow. A basic landscape principle is to put the right plant in the right place. Each plant has unique characteristics and needs to be planted in its special place in the landscape. In its special place, a plant will contribute to the beauty and attractiveness of the landscape.

**L** The “L” means light and is one of the most essential of all plant needs. Light activates chlorophyll, which makes food for roots, stems, leaves and flowers. Some plants need full sun, while others need full shade. Some need a mix of sun and shade. Sun-loving plants need at least six hours of sun each day during the growing season.

A The “A” stands for air. Plants breathe in air (carbon dioxide and oxygen) through the leaves and some stems to help make food for the plant.

**N** The “N” means nutrients or food. A plant needs 16 essential nutrients to grow and be healthy. Of these nutrients, nitrogen (N), phosphorous (P) and potassium (K) are the most needed by plants and may need to be applied in a fertilizer. In plant fertilizer language, they are known as N, P and K. On a common plant fertilizer bag, look for three numbers like 10-10-10 on the label. This is called a balanced fertilizer because in a handful of this plant food, 10 percent is N or nitrogen, 10 percent is P or phosphorous and 10 percent is K or potassium.

**T** The “T” is for thirst or water. Since most plant tissue is made up of water, plants use a lot of water. Landscape plants need at least 1 inch of water per week during the growing season. Use a rain gauge or small can discarded from the kitchen to measure the weekly rainfall in the landscape.
landscape. If the rainfall is less than 1 inch per week, your plant may need additional water from the hose and sprinkler.

S  The “S” stands for soil. Soil is a mixture of sand, silt and clay. It provides support for the plant to grow and a medium for the roots to expand. The roots take water and nutrients (N, P, K and other food nutrients) from the soil to make food for the plant.

**Summary**  During this lesson, you have learned that landscape plants have six basic needs. Plants need a place to grow, light for food, air to make food, nutrients, water and soil. The homeowner must provide the landscape with these basic needs so that the plants will grow and be healthy to produce flowers and fruit. Consider the concepts of this lesson when working on your “Landscape Plan.”

**Self check (Fill in the blanks)**
P _________  
L _________
A _________
N _________
T _________
S _________

Plants needs PLANTS to ____________ and ____________.

**Resources**  In addition to this lesson, please refer to “Working with the Soil in My Yard,” “Watering the Landscape,” “My Landscape Plan” and “Fertilizing the Landscape.”
Introduction
This lesson is about how plants grow and make food. You will learn the common parts of plants and the function of each. Plant growth is important for a healthy and attractive landscape. These plant basics apply to all aspects of the landscape around your house.

Parts of the plant
A plant has many different parts that work together for growth and health, similar to a human being.

- **Terminal bud** – top of a plant stem; main point for new growth
- **Flower** – most colorful part of the plant; where sexual reproduction takes place and seeds are produced
- **Leaf** – leaves are attached to stems; leaves make food for the plant
- **Stem** – connects the plant roots to the leaves and flowers; provides two-way transport of fluids in the plant

All of these plant parts are important for plants to grow and be healthy.

Functions of the main plant parts

- **Flower** – the female and male structures occur within the petals of a flower. The female part is pear-shaped and is in the center. It is called the pistil. The male parts are called stamens and are located around and above the pistil. Some flowers are imperfect; they may have either all male parts or all female parts. Perfect flowers have both male and female parts inside one flower. Wind, insects and gravity move pollen from the
stamens to the pistil. Seeds begin to develop when pollen grains enter the ovules (eggs) of the pistil.

**Stem** – supports leaves and flowers of the plant. The stem transports water and nutrients from the roots to the leaves. The stem also transports food made in the leaves to the roots for growth and storage.

**Roots** – anchor the plant in the soil and support the stem and its related parts above the ground. Water and nutrients enter the roots through root hairs and are transported to the primary root and stem, then to the leaves for food production. Roots also store food in the form of sugars for new growth.

**Leaves** – Food for the whole plant system is made in the leaves. Leaves must have water, nutrients, air and light to make food.

### How plants make food

Plants are the only living things that make their own food. Most food production in plants occurs in the leaves. Food is stored in roots in the form of sugar or starch. When a plant needs energy for new growth, sugars are transported from the roots to developing fruit and seeds in the flower.

The recipe plants use to make food includes the following ingredients: chlorophyll, water and carbon dioxide. Chlorophyll occurs in most of the cells of plant leaves. The green color in leaves comes from chlorophyll. Thus food is made in leaf cells using green chlorophyll, water from the plant stems and roots and carbon dioxide from the air. This food-making process is called photosynthesis. Sunlight is an external force that stimulates chlorophyll to do its work.

Most of the photosynthesis takes place in daylight hours. At night, plants reverse this process and the leaves give off oxygen and moisture – this is called respiration. In both photosynthesis and respiration, oxygen and carbon dioxide gases and water enter and exit the leaf through very small openings called stomata.

### How plants grow

Most plants show new growth in the following areas: extended roots below ground, thicker stems (e.g., tree trunks), extended stems at the terminal buds, new leaves and the formation of blooms and fruit/seeds. The amount of plant growth is determined by the following factors: amount of water, light, nutrients and type of soil. Plant growth can also be affected by insects, diseases, weeds and improper use of the lawn mower, string trimmer and pruning tools.

### Summary

The focus of this lesson has been to describe and show plant parts and function and how plants make food. The main parts of plants are roots, stems, leaves and flowers. All of these parts function together for plant growth and health. Plants make food in leaves through a process called photosynthesis. Important for plant food production, growth and health are water, nutrients, sunlight and air.
Self check  Walk around the landscape and observe a small tree, shrub and grass plant in the lawn. Look for and point out roots, stems, leaves and flowers. Why is it that flowers do not always occur on all the plants?

Resources  In addition to this lesson, please refer to “Plants need PLANTS,” “How to Plant a Plant” and “Pruning Shrubs and Small Trees.”
Introduction  In another lesson, it was emphasized that all “Plants Need PLANTS.” This means that all healthy, growing plants need the following: a place to grow, light, air, nutrients, water and soil. This lesson will focus on how plants are different. Knowing the different characteristics of plants helps the landscaper put the right plant in the right place as it relates to design or the needs of the plant. Different plants may be blended together for a beautiful and attractive landscape. In this lesson, you will learn that plants differ in color, texture, size, shape, growth rate, life cycle and site requirements.

Color  All plants differ in color. The most obvious color difference is in the flower. Plants also differ in the color of their leaves and stems. Color attracts attention and adds beauty to the landscape.

Texture  Texture is the quality of the surface of the leaves and stems of the plant. For example, some plant leaves are shiny and others are rough and dull. Conifers have spiny leaves. Plants with different textures provide an interesting landscape.

Size  Plants vary greatly in size, both in height and in width. Ground cover may be 1 to 2 inches in height, while oak trees may grow to 50 feet. The size of plants is an important consideration. Tall trees should not be placed next to the house and large/wide plants should not be planted near the house so as to cover up the windows and the house itself.

Shape  Plants have their own natural shape. However, many plants can be pruned to a desirable shape to fit into the landscape or for aesthetic purposes. Some common plant shapes are round, flat (on the ground), oval, pyramidal, weeping and columnar (tall and thin). Plant shape is an important factor in landscape design.

Growth rate  Plants may grow 1 inch or 1 foot in a year. Fast-growing plants are good to cover utility fixtures and other unsightly objects. Also, they are effective for borders and privacy.

Life cycle  Plants are classified as annuals, biennials or perennials. Annuals grow stems, leaves and flowers and die in one year. Biennials...
grow stems and leaves in the first year and flowers the second year. Perennials grow stems, leaves and flowers the first year and for many of the following years. Some plants only flower during one season – spring, summer or fall. Others flower continuously.

Need for light and water Some plants require full sun, some full shade and some both sun and shade. Some plants like to grow in wet spots and others grow best in dry areas.

Summary Plants differ in a wide variety of characteristics. These characteristics should be considered when making the landscape plan.

Self check When designing your landscape, which plant characteristics will you consider when putting the right plant in the right place? Remember to consider the special needs of a plant and the way it looks.

Resources In addition to this lesson, please refer to “Landscaping My Yard 2” and “Plants Need Plants.” Also look for illustrations and descriptions of these plant characteristics in plant and seed catalogs.
**Introduction** In this lesson you will learn about the importance of soil and how it relates to plants and the landscape. Soil characteristics and the topography of your yard will influence how you develop your landscape plan. The better the soil, the better your plants and landscape will be.

**Soil is...** Soil is the ground we walk on. Some people call it dirt. Gardeners call it soil. Soil is made up of clay, sand, silt, rocks and organic matter that support plant growth and development.

**Soil and plants** Soil provides 16 essential nutrients needed by plants. The nutrients nitrogen, phosphorus and potassium are the most important for plant growth and health. Also, soil is the medium that supports the plant roots and keeps the plant upright for growth and development.

**Different kinds of soils** The ideal soil is composed of sand, silt, clay and nutritional minerals (50 percent), structural air and water-holding spaces (48 percent), and organic material and living organisms (2 percent). This soil is often called loam.

Soils may be classified according to particle size. Some soils have more clay in them. Clay particles are very small. Clay soils are sticky when wet and hard when dry. Clay soils are difficult to cultivate and hard to dig in with a shovel. Clay soils are usually rich in nutrients. Some soils have more sand in them. Sandy soils warm up and dry out faster than clay soils. Sandy soils are described as lighter soil and allow very good root development by plants. Other soils have more silt in them. Silt particles are medium-sized. Silty soils are sticky and heavy, more like clay soils.

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**Essential Nutrients for Plant Growth**

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<thead>
<tr>
<th>Major Nutrients Elements (9)</th>
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<tbody>
<tr>
<td>C</td>
<td>Carbon</td>
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<td>H</td>
<td>Hydrogen</td>
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<td>O</td>
<td>Oxygen</td>
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<td>P</td>
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<tr>
<td>N</td>
<td>Nitrogen</td>
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<td>S</td>
<td>Sulfur</td>
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<td>Ca</td>
<td>Calcium</td>
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<td>Mg</td>
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<table>
<thead>
<tr>
<th>Minor Nutrients Elements (7)</th>
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<td>Fe</td>
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<tr>
<td>Mo</td>
<td>Molybdenum</td>
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<td>B</td>
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<td>Zn</td>
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<td>Cl</td>
<td>Chlorine</td>
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Soils may also be classified by describing the acidity level. The amount of lime in the soil controls its acidity. A soil rich in lime or chalk is said to be alkaline, basic or sweet. A soil that lacks lime is described as acidic or sour. The degree of acidity or alkalinity in soil is measured on a pH scale. Refer to the lesson “Using Fertilizer in the Landscape.”

Soils and the landscape The kind of soil (clay, sand or silt) may vary in your yard. Within 1-2 feet of the house, the soil may be sandy. This is due to construction involving excess sand and gravel used to build the foundation. This soil will also contain pieces of wood, nails and construction trash. Soil near the house, walk/driveway and street will be compacted due to construction foot and vehicle traffic. Compact ed soil in the yard will make for difficult digging and plants will not grow well in hard soil. The slope of the yard is another way soil affects the landscape. When it rains or when you irrigate the landscape, the water responds to gravity and flows downhill, causing erosion and the loss of soil. There may be wet spots near the downspouts or in other depressed areas of the yard.

Improving the soil The best practice to improve the soil in your yard is to add organic matter. Compost is the most readily available and low-cost organic matter to use. Compost is decomposed leaves, pine needles, tree bark, sawdust and animal waste. Leaving the grass clippings on the lawn is a good example of composting the lawn grasses and improving the soil. When HUG landscapes your home, mulch compost will be added around the plants.

Summary The focus of this lesson was on defining what soil is and how soils are classified. Knowing which type of soil you have, about compacted soils, the slope of your yard and wet spots will assist you when planning and installing the landscape.

Self check Using a shovel or spade, go around your house and lot and dig some small holes. What type of soil did you find? Did you see the gravelly soil next to the house and driveway? Where did you find wet spots? Where did you find some good soil? Describe how it looked, how it felt. Make these notes on your Landscape Plan.

Resources In addition to this lesson, please refer to “Plants Need PLANTS,” “How to Plant a Plant,” “Using Fertilizer in the Landscape,” “My Landscape Plan” and “Landscaping My Yard 1 & 2.”
**Introduction**  Like people, plants need nutrition to be healthy and grow. The “N” in PLANTS means nutrients or plant food. All plants require the basic N, P, K and other nutrients. During this lesson you will learn what a fertilizer is, types of fertilizers, pH, what to buy and when to apply.

**Fertilizer defined**  Fertilizer is a chemical compound that contains the essential nutritional elements plants need to be healthy and grow.

**Need for fertilizer**  The soil naturally provides basic nutrients for plant growth. However, landscape plants need supplemental food to grow properly and resist insects and diseases. The effects of the basic nutrients on plants are as follows:

- **Nitrogen (N)**  
  – helps build leaf and stem growth
- **Phosphorus (P)**  
  – helps the plant make strong root systems
- **Potassium (K)**  
  – helps growth of entire plant, including making blooms

**Up, Down and All Around**

<table>
<thead>
<tr>
<th>N</th>
<th>P</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem and leaf growth</td>
<td>Root and stem growth</td>
<td>Flower, stem, leaf and root growth</td>
</tr>
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</table>

An easy way to remember what each nutrient does for a plant is the phrase, “UP, DOWN and ALL AROUND.”

Testing the soil is the best way to determine which plant food needs to be added. A soil test also shows the pH level.

**pH defined**  pH is a term used to indicate the level of acidity of the water in the soil. A pH scale shows the range of values from 1 to 14 – 1 is very acidic, 14 is very alkaline and 7 is neutral. Thus soils testing below 7 are acidic and those testing above 7 are alkaline. It is important to remember that very alkaline or very acidic soils prevent the soil nutrients from becoming available to the plants. Most landscape plants require a pH range of 5.2 – 6.5.

<table>
<thead>
<tr>
<th>pH scale</th>
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<tr>
<td>ACID</td>
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When the pH is too low (from 1 to 5), nutrients like aluminum, iron and manganese become toxic, while phosphorus and magnesium become deficient. In highly basic soils (from 8 to 14), deficiencies of iron, manganese, boron and molybdenum can occur.

**Different fertilizer products**  A fertilizer product includes the analysis (printed on the container) which indicates how much nitrogen, phosphorus, potassium and/or other minerals are in the product. A fertilizer also includes a carrier that holds and carries the nutrients to the soil and roots of the plants. For example, a common garden fertilizer analysis is 6-12-12. This means that 6 percent of the fertilizer is nitrogen, 12 percent is phosphorus and 12 percent is potassium, for a total of 30 percent nutrients. The rest of the fertilizer product is 70 percent carrier.

- **Liquid fertilizer**  
  – readily absorbed by plant roots and leaves  
  – short-term  
  – apply with container sprayer, hose or sprinkling can
- **Granular fertilizer**  
  – most common form of fertilizer  
  – apply 2-3 times per year  
  – apply by hand or spreader  
  – brush off granules left on plant foliage
- **Slow-release**  
  – nutrients slowly released during a six-month period  
  – apply one or two times a year  
  – apply by hand or spreader  
  – higher cost
• **Organic**
  - composted animal and plant waste
  - low nutrient content
  - apply by hand, spring and fall
  - improves the soil and feeds the plants

• **Lime**
  - a calcium product to raise the pH level
  - powdery form is more quickly absorbed but more difficult to apply
  - pelleted form is more easily spread but takes time to break down for plant use

### When to fertilize. Here are a few general guidelines:
- Fertilize annuals and groundcovers monthly.
- Newly installed shrubs and perennials require more frequent fertilization.
- Fertilize only during the growing season, e.g., March, May and June.
- If needed, apply lime in fall; it may take up to six months to raise the pH level.

### Amount of fertilizer to apply
The fertilizer container indicates how many pounds to apply for a given ground space area, for example, 5 pounds per 1000 square feet of space. The lime container indicates how many pounds to apply to raise the pH level a given number of points on the pH scale.

### Summary
During this lesson you have learned that most fertilizers contain varying amounts of nitrogen, phosphorus and potassium. Remember that plants need these basic nutrients in the largest amounts. It was emphasized that pH, or the acidity level of the soil, influences how much of the nutrients are available to the plant for growth and health.

### Self check
Contact a Master Gardener to assist you in making a soil test. When HUG installs your landscape, inquire about when the plants have been or should be fertilized. Visit a garden store and read the labels on a fertilizer and lime container.

### Resources
In addition to this lesson, please refer to “Plants Need PLANTS,” “Using Mulches in the Landscape” and the “My Landscape Calendar.”
Introduction  This lesson is about landscaping the yard. You will learn what landscaping is, the purpose, the advantages and why one should make a landscape plan. The second part of this lesson emphasizes landscape design principles.

Example of landscape design using plants with color to create a beautiful outdoor space. The homeowner also used the shade from a tree for a cool sitting area.

Landscaping can be a dynamic activity involving the whole family. A landscape plan includes the location of the house and drive and walkways relative to your lot boundaries. It also includes recreation areas, pet space and the location of trees and perennial/flower beds.

Landscaping  Landscaping is the art of arranging trees, shrubs, grasses and annual/perennial plants around the house, walks, driveways and other fixed objects on a piece of property, to produce a pleasing and picturesque effect.

Purpose of landscaping  To plant trees, shrubs, grasses and perennial/annual plants in their proper places for an attractive appearance.

Advantages of landscaping:
• Controls soil erosion
• Cools the air
• Captures carbon
• Makes the house/property more attractive and safe
• Increases the value of the property
• Promotes a cleaner environment
• Increases the joy of planting and watching plants grow
• Attracts birds and butterflies
• You can do it yourself

Why make a landscape plan?
• Saves time, money and effort when done in advance
• Encourages thinking about areas for play, work, garden, privacy, security
• Planning ahead allows time for drawing, sketching, trying out ideas, arranging
• Helps to plan for the first, second, third year of your landscape and the future
• Encourages thinking about soil conditions, slopes, borders, established trees
• Helps to problem solve in dealing with slopes, erosion, utility fixtures

Developing a landscape plan  A good landscape plan should show where each new plant should be located. Remember the landscaping maxim, “Put the right plant in the right place.” The location for the new plant should be based upon its mature appearance, such as height, width, texture and color. Other factors include the plant’s preference for sun or shade and wet or dry conditions.

Summary  Landscaping is a dynamic activity that can involve the whole family throughout the year. The results can be immediate and add value and beauty to your house and home. A landscape plan can save time and money by putting the right plant in the right place. Landscape planning can help to deal with problems around the house ahead of time and spread the cost over several years.
Self check  On a plain sheet of paper and from the Habitat documents given, draw the shape of the lot. Then draw the shape of your house on the lot. Be sure to put the house outline in its proper location on the lot. Draw in the driveway, walkways, porches and any other fixed objects. Draw circles where established trees and any other permanent plants are located. Include areas for recreation, pets and a vegetable garden if there is a family interest. Make a list of your favorite plants.

Resources  In addition to this lesson, please refer to “Landscaping My Yard 2,” “Plants Need Plants,” “Working with the Soils in My Yard” and “My Landscape Plan.”
Introduction The previous lesson presented some very basic landscaping guidelines. Remember that landscaping your yard is partly a science, which means following tested landscaping practices. Secondly, it involves using art principles that may include your own preferences. This lesson will focus on using five terms (scale, form, texture, line and color) when developing a landscape plan. Using these terms in the plan will result in an attractive landscape around your home.

Scale Scale means that your landscape materials and plants should fit well with the size of your house and your lot. For example, planting a small oak tree in your yard that would grow to 100 feet tall would not fit well with your house and lot. Understand the mature size when deciding the placement of a tree.

Form Refers to the shape of the plants in your landscape. They may be oval, upright, spreading, columnar, pyramidal or weeping. Form can also refer to the shape of your landscape beds. Plant beds may be circular, square, rectangular or free-form.

Texture Texture, in landscape talk, refers to the surface quality or shape of leaves of a plant. Foliage might be feathery, coarse, rough, spiky or glossy, just to name a few.
**Line**  Line includes the arrangement in the landscape that causes a person to look from place to place. For example, a line of plants forming a border can lead your eye to the front porch or around to the side of the house. Sidewalks and driveways are hardscapes that usually lead one’s view to the front of the house.

**Color**  Color adds interest and attractiveness to your landscape. Color changes with the season. Annual plants can be added to the landscape for instant change in effect. The use of the color wheel graphic helps one to use the proper colors in combinations pleasing to the eye to develop an attractive landscape.

The primary colors are red, yellow and blue. This means that all other colors are mixtures of these three. The secondary colors are orange (a mix of red and yellow), green (yellow and blue) and purple (red and blue). Colors that are near to one another on the color wheel are referred to as analogous (or harmonious). Colors that are across from one another are called complementary (or contrasting). Colors can also occur in many shades of the same color.

A color circle, based on red, yellow and blue, is traditional in the field of art. Sir Isaac Newton developed the first circular diagram of color in 1666.

**PRIMARY COLORS**

Red, yellow and blue

In traditional color theory, these are the three pigment colors that can not be mixed or formed by any combination of other colors. All other colors are derived from these three hues.

**SECONDARY COLORS**

Green, orange and purple

These are the colors formed by mixing the primary colors.

**TERTIARY COLORS**

Yellow-orange, red-orange, red-purple, blue purple, blue-green and yellow-green

These are the colors formed by mixing a primary and a secondary color. That’s why the hue is a two-word name, such as blue-green, red-violet and yellow-orange.

**Other Aspects of Landscape Design:**

**Sound**  – the sound of the wind blowing through trees, ornamental grass stems and leaves.

**Fragrance**  – aromatic plants (like herbs) and flowers that have a pleasant smell.

**Water feature**  – the sound of falling or splashing water.

**Summary**  During this lesson you learned that scale, form, texture, line and color are important guidelines when landscaping the yard. When these guidelines are followed, the landscape will add beauty and attractiveness to your property. Use these guidelines as you plan and install the plants in your landscape.
Self check  As you develop your landscape plan, write or label the areas where you will use scale, form, texture, line and color to enhance the landscape. As you drive to and from work, look for these landscape elements in business and home landscapes.

Resources  In addition to this lesson, please refer to “Landscaping My Yard 1,” “Color Wheel,” and “How to Buy a Plant 1 and 2” and “My Landscape Plan.”
Landscape Planning Directions:
1. Use a pencil to draw a large outline of your lot on the next page of graph paper. Refer to the lot diagram given to you by Habitat or from your County Register of Deeds office.
2. Draw an outline of your house (top view) as located on your lot. Show porches, steps, driveway, walkways and any established trees.
3. Identify the areas in your yard and their uses (for example: recreation, pet area, vegetable garden).
4. Complete this Landscape Planning Sheet during the landscape class.
5. On the following table, make a list of the type and number of plants you want in your landscape. See class handout Plant Inventory in the HUG Nurseries, which refers to the plants available.
6. Create a symbol to represent each plant in the plant list.

Other Landscape Planning Decisions:
7. Please remove or kill all grass in areas where landscape plants are to be planted
8. Do you want mulch? _____
   Do you want landscape fabric (to lay on the soil under the mulch)? _____
9. A Master Gardener will visit you at your home to finalize the plant list and your landscape plan. Your landscape will be installed on the next Saturday.
10. On planting day, you must be present at your home with your completed landscape plan to assist with installation.

List the type and number of plants you want in your landscape. See class handout “Plant Inventory in the HUG Nurseries,” which refers to the plants available. If you would like to add a plant(s) of your own, make sure plants are available for the day of planting (see lessons “How to Buy a Plant 1 & 2”).

My Plant List

<table>
<thead>
<tr>
<th>Plant Number</th>
<th>Name of Plant</th>
<th>Description (sun/shade, shrub or tree, color)</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>15</td>
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</tbody>
</table>

22
Draw Your Own Landscape Plan
Introduction  Most gardeners like to buy new plants. Avid gardeners shop for plants and seeds like some people shop for clothes. They go from garden store to nursery looking for plants that will fit into their garden plan. This lesson will help the homeowner ask the right questions when shopping for plants for the landscape. The second part of this lesson deals with how to read and use the information on a plant label.

Many homeowners have taken the HUG landscaping course. They have attended class, helped to make a landscape plan and have helped to plant and mulch the plants. Some have helped their neighbors and other homeowners plant their landscapes. Other family members have helped and become involved in developing the landscape. These activities show that many homeowners are interested in gardening.

Where to buy a plant or more plants for my landscape  Interested gardeners like to buy more plants because they want to add some plants not provided by HUG or some plants may have died or need to be replaced. Gardeners may want to add some color and attractiveness with annual flowers or they want to add a new area of plants to the total landscape. Landscape plants may be purchased from garden centers, nurseries and garden departments in larger home stores. See the “Shopping for New Plants” section below.

Which plants to buy  During the HUG landscaping class, homeowners were asked many times, “What kind of a landscape do you want?” Some related questions included the number and variety of plants; the color, size and shape of plants; choices of summer and winter plants; and other landscape considerations.

When developing your landscape plan, review these questions again. Then ask yourself, what are the next steps in developing your landscape? What are your long-range plans? A well-thought-out landscape plan should show which plants to buy next. Buy a plant that you like and that fits into your landscape plan. Select and install only the plants that you can care for the first year. Then add plants as you can afford them in the second and future years.

Shopping for new plants  Based on your landscape plan, need and your personal preferences, visit local nurseries, greenhouses and garden stores that have the plants you need; • Consider the locations and reputation of the plant store; • Compare prices and look for sales (usually late spring and fall); • Does the salesperson answer all of your questions? Are the plants warranted for a year?

Other plant-buying tips  All the plants should appear to have been recently watered; all plants should be tagged or labeled (see lesson “How to Buy a Plant 2”); stems should be firm and straight; leaves should be erect and free of mold and insect damage; and flowers should be bright and of true color.

When buying flowers, choose plants with unopened buds to add longer-lasting color in the landscape. Avoid buying plants that are wilted, have broken branches or have an unbalanced shape. Gently slide the pot off the rootball to check for healthy roots. Avoid plants where the rootball has a bad odor, roots appear to be rotten or roots are circling the inside of the pot.

Summary  Buying vigorous, healthy plants for the landscape is one of the most important decisions a homeowner will make. Selecting the best plant for the landscape is like buying a new clothing item – best plant, best price. After entering a reputable garden store, remember to look for the best plant: 1) consider where the plant fits in the landscape; 2) read the label; 3) check for healthy leaves, stems and roots; and 4) look for overall plant health.
Self check  Go to a garden store, nursery or refer to a catalogue and make a list of the plants that will fit into your landscape plan. Consider plants available from HUG, your preferences and the cost of new plants. (You may want to refer to your favorite plant list from “Landscaping My Yard 1.”

OR

Go to a garden store and check this list when buying a plant for the landscape:
• store reputation __
• plant fits landscape __
• price __
• plant tag present __
• healthy stems, leaves, roots __
• damp soil in pot __

Resources  In addition to this lesson, please refer to “Landscaping My Yard 1 and 2,” My Landscape Plan” and “My Landscape Calendar.”
Introduction You have learned that one of the basic landscaping principles is to put the right plant in the right place. Now you are shopping for that “right plant” using your landscape plan and your personal preference. This lesson will help you to read and understand the label on that “right plant.” Buying the “right plant” will save you shopping time and give you peace of mind.

Information on a plant label Remember that all plants should have a tag or label. Do not buy a plant that does not have a label. A proper plant label can have up to 20 bits of information on the front and back side of the label.

Plant label On the following page is a list of information that may be printed on a plant label. Check items off as you locate the corresponding information on the plant label (see graphic). In order to simplify this list, look for the label parts that have an asterisk (*). These items are most important when making a plant choice for your landscape.
Summary Not all plant labels are as complete as this one. When plant labels are incomplete, ask the salesperson about the missing information. These basic plant characteristics should help you choose that “right plant” to buy for your landscape. Consider the information in this lesson when adding plants to your “My Landscape Plan.”

Self check Go to a garden center and use the checklist to help you find a plant for your landscape plan.

OR

As you complete the self check from the previous lesson, examine closely the plant label. How many of the 10 basic plant characteristics occur on the label? Did you ask the salesperson for more information?

Find out what your hardiness zone is: ______

Resources In addition to this lesson sheet, please refer to “Landscaping My Yard 1 and 2,” “How Plant Varieties are Different,” “How to Buy a Plant 1” and “My Landscape Plan.”

Plant Label Checklist:
___ Plant name:
___ Scientific and/or Common*
___ Plant picture in color*
___ Size (mature size)
___ Kind of bloom
___ Time of bloom*
___ Light/Exposure
___ Life cycle* (annual, biennial, perennial)
___ Height*
___ Width*
___ Growth habit
___ Heat tolerance
___ Spacing
___ Water requirement*
___ Growth rate
___ Where to plant
___ How to plant
___ Cold hardiness*
___ Pruning
___ Fertilization
___ Special care*
___ Warnings
___ Store name
Introduction  Garden tools are expensive, so one must shop around and look for the best tool at the best price. This lesson will focus on buying the basic tools first, such as a hose, shovel, rake, trowel and pruners. Where to buy tools and maintaining them will also be emphasized.

Tools for grass maintenance  If you have grass in your yard, you will likely need the following items: a lawnmower, a fertilizer spreader (can be either a drop or broadcast spreader), hand clippers for trimming around trees and along sidewalk and flower bed edges, (a string trimmer is very convenient for larger yards and budgets), and a broom rake for raking leaves if you have deciduous trees in your yard.

Tools for landscape planting and maintenance  If you have either flowers and/or vegetables, these tools will be very helpful:
- a pointed shovel (either long- or short-handled) or a garden spade for digging holes
- a trowel for digging smaller holes when planting flowers or vegetable seedlings
- a watering can and/or a hose with a watering wand
- a garden rake can be useful in spreading mulch or for leveling soil for planting
- a pair of pruning shears (bypass shears are preferred, but anvil pruners will also work for most purposes)
- a pick or mattock is very helpful in digging up hard clay soil or soil with lots of rocks (these two are heavy and take a good deal of strength to use properly)

Where to purchase garden tools  The best deals on hand tools are generally at retail stores. Certainly, hardware stores and garden stores have every tool you could imagine, but they tend to be more expensive. Lawn mowers can also be purchased at these places, but if you know what to look for, a used unit from the newspaper want-ads may provide the best deal. New power lawn mowers can range from $150 and up for larger models.

Maintaining garden tools  Most hand tools can be kept in good condition by just making sure they are clean and dry before you put them away. This will prevent corrosion and rust. Spreaders should be hosed out after use, and then allowed to dry before returning them to their storage area. Residual fertilizer will attract moisture, which will cause metal parts to rust or corrode. Shovels and pruners work best when they are sharp. Thus, if they become dull, you should have them sharpened or you can do it yourself with a file or grinder. Be very careful with sharp pruners, as they can cut you as easily as they go through a flower stem or twig. For lawnmowers, cleaning after every use is
the proper thing to do. With normal use, the following items should be done once per year: change the sparkplug, change the oil and clean the air filter. If you have a gas-powered string trimmer, the same applies for it. If you should mow when your grass is wet, be sure to clean the wet grass clippings out from under the mower, as leaving them there will encourage mold to grow and rust to form.

Summary  During this lesson you have learned about the importance of having the right tools, which tools to buy and maintaining the tools you own. One cannot install and maintain the landscape without the proper tools.

Self check  Make a list of the tools that you will need to maintain your landscape. Start with the most essential tools for the landscape; for example, a garden hose and shovel. You may need to refer to “My Landscape Plan.”

OR

Before you install and try to maintain the landscape, go to a reputable garden store or ask a friend if you can borrow some garden tools. Use the basic list below to start your tools-needs list.

Basic and essential tool list:
• garden hose
• wand/sprinkler
• shovel
• rake
• pruners
• trowel
• lawn mower
• gloves
• __________
• __________
• __________
• __________

Resources  In addition to this lesson, please refer to “My Landscape Plan,” “How to Plant a Plant” and “My Landscape Calendar.”
Introduction  Whether starting a new landscape or expanding an existing one, planting new or moving older plants is a very important job. When a plant is moved, it undergoes considerable stress or shock. Using best planting practices, including choosing the right location for the plant (remember “right plant, right place”), will allow the plant to adjust to its new location.

This lesson is about digging a hole correctly in your landscape for a new plant. These guidelines apply to planting trees, shrubs, annuals, perennials and bulbs. The new plants may be in pots, rootball-wrapped in burlap or bare-rooted.

Digging a planting hole  Using a shovel/spade, dig the hole twice as wide as the container and not as deep as the height of the container. Pile the dug soil near the hole. This is called fill soil. Remove rocks, trash and other debris and discard. The hole should have vertical sides and a flat bottom. Place the container in the hole to check for proper size. The soil level in the pot should be slightly above the upper edge of the hole.

How to plant  Remove the rootball from the pot. If there are excessive roots showing, stripe or cut the roots by using a sharp knife. This will encourage new root growth. Set the rootball in the hole and position the plant to your liking. The trunk of the plant should be vertical, not leaning. If the rootball is wrapped in burlap, cut away and remove as much of it as you can. Begin to add the fill soil, along with water. Firm and pack in the fill soil around the rootball and roots. This eliminates air pockets and ensures direct contact of the roots and the soil. Form a small ridge around the outside of the filled hole to hold water for the plant roots.

How to mulch. Add 2 to 4 inches of mulch at the base of plant and pull away from trunk. The mulch should be level and extend out to the ridge or edge of the hole. Mulch helps to keep the rootball moist and reduces weeds from growing near the plant and competing for water and nutrients in the soil. Mulch should not touch the trunk!

Irrigation  Remember that all plants need 1 inch of water per week during the growing season. All new plants require more than 1 inch of water per week for the first three months. Then irrigate with at least 1 inch of water per week for the first year, especially through dry, hot summer conditions.
Summary  This lesson has emphasized four steps in planting a plant: 1. digging the hole properly, 2. installing the plant in the hole, 3. adding fill dirt, and 4. correct mulching and watering of the plant. Carefully planting a plant is important to reduce the shock as the plant moves to its new ‘home.’ These steps apply to the planting of all plants, from annuals to trees.

Self check  Teach a friend how to plant a new plant using the guidelines above.

OR

Observe the Master Gardener demonstration on planting day in your yard. Look for these important steps:
• plant the right plant in the right place
• dig the hole to the proper width and depth
• install the plant and use natural fill soil
• add 2 to 4 inches of mulch
• water deeply and regularly for about two months

Resources  In addition to this lesson, please refer to “My Landscape Plan,” “Landscape Tools Needed,” “My Landscape Calendar,” “Using Mulch in the Landscape,” “Watering the Landscape” and “My Landscape Plan.”
Using Mulch in the Landscape

Introduction Mulch has many uses and can add attractiveness to the landscape. This lesson will focus on using mulch, the types of mulch, applying mulch and sources and cost of mulch.

Using mulch in the landscape There are three basic purposes of mulch in the landscape. First, mulch reduces the number of weeds and also the competition for water and nutrients among the landscape plants. Second, mulch reduces water loss by evaporation, thus keeping more moisture in the soil for your landscape plants. Third, mulch can enhance the attractiveness of your landscape and home.

Example of proper mulching: 
3” of mulch spread around plant.

Types of mulch The type of mulch that will be best for you depends on your preferences and circumstances. How do you want it to look? What color do you like that would look good with your house and yard? How easy is it to handle? (For example, stones are heavy and can be difficult to move around.) How much do you need, and what will be the cost?

Types of Mulches:

Organic:
- straw
- leaves
- pine needles
- tree bark
- composted wood chips

Inorganic:
- newspapers
- landscape fabric
- gravel
- crushed bricks

Sources of mulch Mulch is generally available at retail nurseries and home improvement stores. In the spring and summer, many times you can get it at discount or dollar stores or even at gas stations. It may be sold in bags or in bulk. Depending on the source; you can pick it up or have it delivered. Garden stores have many varieties of bagged and bulk mulch.

Applying mulch Mulch is usually spread by shovel, or by dumping it on the ground and spreading it by hand or with a garden rake. Normally, mulch is applied as a blanket 2-4 inches thick. You need to be sure that you keep the mulch a few inches back from the trunks and limbs of trees and shrubs, because getting it too close can contribute to stem rot and pests getting into your plants. Note that one cubic yard of mulch will cover about 100 square feet (10 feet x 10 feet) at a depth of about 3 inches.

Cost. The price of mulch depends on the type of material. It can range from a low of $2 to $3 for a bag (usually 2 cubic feet) to $16-25 for a cubic yard (27 cubic feet or a good pickup truck load). This would be typical for ground-up wood chips. A few phone calls can usually help you determine where to get the best deal for the type of material that you want. As you shop for mulch, also consider location and cost.
Summary During this lesson you have learned about the importance, types and use of mulch in the landscape. Basic organic mulch can save water, reduce weeds and increase the beauty of the landscape.

Self check Observe the mulching demonstration by a Master Gardener when the landscape is installed in your yard. A landscape fabric may be installed to further reduce weeds and reduce soil water evaporation. Help the Master Gardener spread the mulch evenly, at the right depth and away from tree and shrub trunks. Add a rock or other item for accent in your landscape.

Resources In addition to this lesson, please refer to “My Landscape Plan,” “How to Plant a Plant” and “My Landscape Calendar.”
**Introduction**  Plants do not drink the way we do. Instead, they take water up through the roots and release water into the air through tiny pores in their leaves. This process is called transpiration. Transpired water becomes a vapor, which is absorbed into the earth’s atmosphere. These water vapors collect together in clouds and return to earth as rain.

Most plants are composed of more than 50 percent water. Thus trees, shrubs, lawn grasses and other landscape plants require a lot of water to maintain good growth and health. In another lesson it was learned that plants require at least 1 inch of water per week. Since we do not get 52 inches of rain per year, nor do we always receive the needed rain at the right time, there is a need to supplement nature with additional water. This lesson will focus on when and how to irrigate the landscape.

**Importance of irrigation**  As mentioned above, plants need at least 1 inch of water per week. Nature does not always provide that amount for proper plant growth and health. Lawn grasses are shallow-rooted and are very sensitive to days of heat and lack of rain. Water also helps carry vital nutrients through the roots into the plant.

**When to irrigate**  Irrigate during the drought season of May to October. The recommended time of day is during the morning hours (before 10 a.m.). This minimizes the amount of evaporation and gives the plant time to dry before night-time hours. Overnight wetness causes fungi and molds to grow on and damage the plants. **Remember:** plants need 1 inch of water per week.

**Proper irrigation**  Put the water on the soil around the trunk of the plant rather than on the foliage. Irrigate deeply, soaking the soil around the rootball one or two times per week rather than light sprinkling every day.

**Type of irrigation systems**  For most small landscapes, one needs a hose, wand and sprinkler. The hose should be long enough to reach the farthest point in your yard or landscape. Rubber hoses are more expensive but are more durable, do not kink and withstand sun and impact better. Vinyl hoses are less expensive, easier to handle and will be usable for several years if maintained and stored properly. Soaker hoses are laid in the landscape and allow water to ooze out the sides directly to the soil and plant roots. Coiled hoses recoil for ease of storage and are convenient on patios and in small spaces.

Always attach a wand to the end of the hose when watering the landscape plants. The wand nozzle spreads out the water and causes less erosion of the soil around the mulch and soil in
the landscape. Remember to spray the mulch and soil, not the foliage.

Oscillating and fountain/stationary sprinklers are good for irrigating larger areas of the landscape, such as lawns. The use of these devices saves time because you can do other chores while watering the landscape.

**Summary** One of the most important and best landscaping practices is properly irrigating the plants in the yard. All plants require at least 1 inch of water per week. Using the landscape plan, note the plants that do not require a lot of water. For all the other plants, water deeply, trying to keep the water off the plant foliage. New plants require more frequent irrigation than established plants.

**Self check** Which type of irrigation will you need for your landscape? How will you know when to water your landscape?

**OR**

Buy an inexpensive rain gauge and install it in the landscape away from the house and tall trees and shrubs. Using your landscape calendar (at the end of this Handbook), set aside one or two days per week to check the rain gauge and irrigate the landscape properly.

**Resources** In addition to this lesson, please refer to “How to Buy a Plant 2,” “My Landscape Plan,” “How to Plant a Plant,” “Landscaping Tools Needed,” “Plants Need Plants” and “My Landscape Calendar.”
Introduction  Weeds are a common problem because they compete with landscape plants for water and nutrients. During this lesson you will learn how to identify common weeds in the landscape, how weeds reproduce and how to control them.

A weed is any plant that is growing in the wrong place. A maple tree sapling growing in your landscape that is not supposed to be there should be moved or discarded. Remember that most weeds are native plants and can survive drought and hot and cold weather.

Weed problems  Generally, weeds are not attractive in your landscape. In addition, they compete with your desirable plants for valuable nutrients, water, sunlight and space. Many weeds are very vigorous growers and will crowd out your landscape plants if you don’t take action to prevent them.

How weeds reproduce  Most weeds reproduce by generating and spreading seeds. Also, some plants, including several unwanted types of grasses (goosegrass and bermudagrass), spread by underground runners. Many of these will grow from pieces of root that are left in the ground even if you pull up most of the roots and all of the foliage. Finally, some weeds (like wild strawberries) can reproduce from above-ground runners, which send down roots and sprout a new plant at the end of the runner.

Controlling weeds  The best method for controlling weeds is to prevent them from growing. If you do get some that sprout, the least expensive method of control is simply to pull them out by hand or to hoe them out. This is easiest when they are small and when the soil is loose and/or damp. Applying a landscape fabric around new landscape plants prevents weeds from growing and allows water to penetrate to the root systems. Chemicals are available to kill weeds, but great care must be used to prevent damage to desirable plants. Similarly, pre-emergent herbicides will prevent seeds from germinating (both weed seeds and any that you might purposely plant). Always follow the label on the herbicide package. Finally, a 2- to 3- inch layer of mulch will help to reduce the number of weeds growing in your landscape.

Useful tools in dealing with weeds  The most common tools for weed control are various types of hoes, and a dandelion weeder

### Top 10 common weeds

<table>
<thead>
<tr>
<th>Weed</th>
<th>How they spread</th>
<th>When to control</th>
</tr>
</thead>
<tbody>
<tr>
<td>henbit</td>
<td>seed</td>
<td>cool-season</td>
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<tr>
<td>dandelion</td>
<td>seed</td>
<td>spring, anytime</td>
</tr>
<tr>
<td>chickweed</td>
<td>seed</td>
<td>spring</td>
</tr>
<tr>
<td>plantain</td>
<td>seed</td>
<td>spring</td>
</tr>
<tr>
<td>wild violet</td>
<td>seed and division</td>
<td>spring, anytime</td>
</tr>
<tr>
<td>wild onion</td>
<td>bulblets and seed</td>
<td>cool-season weed</td>
</tr>
<tr>
<td>clover</td>
<td>seed and division</td>
<td>spring, anytime</td>
</tr>
<tr>
<td>nutsedge</td>
<td>seed and bulblets</td>
<td>spring, anytime</td>
</tr>
<tr>
<td>purslane</td>
<td>seed and division</td>
<td>spring, anytime</td>
</tr>
<tr>
<td>crabgrass/goosegrass</td>
<td>seed</td>
<td>early spring</td>
</tr>
</tbody>
</table>
(sometimes called a spud). Also, a sprayer and/or a spreader (either a drop or broadcast spreader) will be needed to apply chemicals that are either liquid or granular in form. Sometimes a string trimmer is needed if the weed infestation is heavy and you do not need to protect landscape or vegetable plants.

**Summary** A weed is any plant out of place. As native plants, weeds are vigorous and compete with landscape plants for water, nutrients, light and space. Weeds may be best controlled by hoeing or pulling out when they are young and tender. Using a pre-emergent granular herbicide is a safe and effective way to prevent weeds from your landscape.

**Self-check** Outline a weed control plan for your landscape.

OR

How many weeds can you name and identify in your landscape? Set aside a time each week to control the weeds in your landscape. Discuss the weeds and their control with the Master Gardener visiting you and your landscape.

**Resources** In addition to this lesson, please refer to “Landscaping Tools Needed,” “Using Mulch in the Landscape” and “My Landscape Calendar.”
Introduction  During this lesson you will learn about beneficial and harmful insects and what they do in the landscape. It is important to know the life cycle of insects in order to promote or control insect populations.

Typical life cycle of some insects:
• **Stage 1 – egg.** Most females are fertilized and lay the eggs in masses in a favorable location for development. A common location is the underside of leaves.
• **Stage 2 – larva.** Eggs hatch to form a worm-like insect appearance. The insect grows rapidly, molts several times by shedding and regrowing its outer body.
• **Stage 3 – pupa.** A resting stage where the insect becomes enclosed in a protective covering, sometimes called a cocoon.
• **Stage 4 – adult.** The most active stage in damaging plants or showing off its beauty and uniqueness in the landscape. Most adults live for a few days to a few weeks.

Most insects have a single generation a year
Most require exposure to low temperatures in order to complete their four-stage cycle. Eggs, larva and pupa vary in size, shape and color and are naturally hidden throughout the landscape. The adults were created to blend into the landscape also. However, their unique markings, movement and evidence of plant damage help to identify the harmful insects to control.

Beeficial insects in the landscape:
• pollinate flowers so that seeds and fruit may be produced
• are predators that eat harmful insects
• decompose plant material to form compost

Examples of beneficial and harmful insects:
**Beneficial:**
• bees
• praying mantis
• spiders
• butterflies/caterpillars
• lady beetles

**Harmful:**
• Japanese beetles
• slugs (not exactly an insect, but still not good)
• squash vine borers
• cutworms
• aphids
To control insects you can:
- manually pick insects off the plants, collect in a container and destroy
- apply chemical treatment – follow directions on the container
- plant companion plants – use plants in the landscape that discourage insect growth
- encourage birds and other predators

Summary
Insects may be harmful or beneficial in the landscape. Harmful insects chew, suck and spread disease among landscape plants. Beneficial insects pollinate flowers, eat other insects and decompose plant material to form compost. Harmful insects may be controlled manually by picking, attracting birds or by chemical treatment.

Self check
Walk around your yard and look closely at all the plants. List and describe the insects that you see. Does the time of day affect when and where you see certain insects?

Resources
In addition to this lesson, please refer to “Plants need PLANTS” and “My Landscape Calendar.”
Introduction  During this lesson you will learn about plant diseases and some useful prevention and control procedures. Fungi, bacteria and viruses are in the air all around us and can make plants sick. Like people, plants need to be kept healthy to avoid harmful diseases.

Fungi (Fungus)  These are neither plant nor animal. Most fungi feed on organic matter and by-products of other organisms. Some fungi are beneficial and are used in foods to make bread, cheese and yogurt. Others are parasitic and feed off plants. Fungi cause such diseases as black spot, powdery mildew and sooty mold on plant leaves. Fungi grow from spores rather than seeds. The spores occur in large numbers in the air. During damp and rainy periods, fungi spores fall on plants and begin to grow. Fungi may be controlled by applying an approved fungicide which is available at a garden store. Follow the directions carefully, such as how, when and where to apply. Always follow the safety precautions found on the label.

Bacteria  Bacteria are another cause of disease in plants. They are single-celled microorganisms that cannot make their own food. Bacteria usually occur in the air and soil. They spread to plants from tools, water and wind. They live and grow in plants by entering openings or wounds made by cuts, scrapes, breaks and holes from boring/chewing insects. As the bacteria grow and multiply, they clog the movement of nutrients through plant tissue. When the upper plant parts do not get water and nutrients, the leaves and stems wilt and the plant dies.

Viruses  Viruses are a third cause of disease that affect plants. These microscopic pests enter and live off living plants. They cause abnormal growth and color variation in foliage and flowers. There is no home cure for viruses that infect plants. To control viruses, remove and destroy infected plants and kill the aphids or thrips, which most commonly spread viruses.

Abiotic  When a plant does not have signs of a fungus, virus or bacteria, it may have an abiotic disease. Abiotic is a general name for environmental problems. These diseases are usually caused by harsh factors in a plant's environment. Examples of abiotic diseases are: water stress, sunburn, lack of nutrients or too many nutrients, herbicide damage, cold or heat injury. These problems are often easy to correct with few or no chemicals.

How to keep plants healthy  These practices can prevent many diseases from invading the landscape.
- Buy healthy plants
- Plant at the right time
- Plant disease-resistant plants
- Provide each plant its own space
- Keep harmful insects to a minimum
- Remove and destroy sick and dead plants
- Irrigate properly
- Fertilize plants to keep them strong and healthy
- Prune plants using safe practices
- Place mulch at proper depth and away from plant stems and trunks

Common green landscape diseases
The following is a partial list of landscape plant diseases, causes and suggested solutions. Some of these diseases could affect grasses, perennials, shrubs, trees and flowers.

Summary  Plant diseases are caused by small, complex organisms called fungi, bacteria and viruses. These organisms are in the air all around us and difficult to control. The best ways to prevent diseases are to buy resistant varieties, keep the landscape clean and prevent harmful insect infestations. Gardeners should observe landscape plants for diseases each week.
**Self check** Walk around the yard and look for the diseases listed and described above. Record your descriptions of plant diseases you find in the landscape on the monthly landscape calendar (at the end of this handbook). Prune and destroy any dead parts of plants.

**Resources** In addition to this lesson, please refer to “Plants Need PLANTS,” “How to Buy a Plant 1 and 2,” “Naming and Controlling Insects in the Landscape” and “My Landscape Calendar.”

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<tr>
<th>Symptom found on plant</th>
<th>Possible cause</th>
<th>Solution</th>
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| Loss of flowers        | 1. Poor pollination  
2. Air pollution | 1. Try to help pollinate the plant by brushing flowers lightly or encouraging bees for pollination  
2. Avoid planting near car exhaust on driveways and streets |
| Swollen, split area on stem or trunk | Fungal or bacterial canker | Prune diseased branches; clean pruners. Destroy branches (do not compost) |
| Yellowing of the leaves | 1. Nutrient deficiency  
2. Herbicide injury  
3. Fungal or bacterial root disease | 1. Add a balanced fertilizer (8-8-8)  
2. Depending on extent of damage, water and wait for plant to recover  
3. Fungicide can be applied to root system. If fungus disease is identified, avoid over-watering and plant stress |
| Gall: a swelling or tumor-like growth | 1. Insects and mites  
2. Fungal or bacterial disease | Remove infected branch or leaves:  
1. Use an insecticidal soap or identify insect to select the proper insecticide  
2. Identify disease for proper chemical control |
| Blight: a sudden, severe withering of plants | 1. Bacterial infection called fire blight common in fruit trees  
2. Winter injury on new plant growth | 1. Prune out diseased tissue, cleaning tools between cuts  
2. Water plant to reduce stress and remove dead branches with clean tools |
| Wilt | 1. Leaves turn yellow at margins then brown and wilt  
2. Lower leaves turn yellow, wilt and die  
3. One side or entire plant may wilt or yellow | 1. Verticulum bacteria  
2. Nematodes or boring insects  
3. Root rot: bacteria or fungus in roots | 1. Use resistant varieties and rotate crops  
2. Rotate crop or drench soil with insecticide for nematodes  
3. Avoid over-watering and plant stress; repot with new soil if in a container |
| Powdery substance on leaves | Fungus called powdery mildew on green foliage | Wash plant down with soapy water. Thin out to increase air between branches |
| Rust | Orange-yellow spots on leaves caused by a fungal rust | Avoid plant stress and add a balanced fertilizer (8-8-8) |
| Leaf spot | 1. Angular spots on leaves caused by bacteria  
2. Circular or oval spots on leaves caused by fungus or bacteria | Use good sanitation and remove dropped leaves. Fertilize roots with balanced fertilizer (8-8-8). Choose disease-resistant varieties. A fungicide may be used if fungus is causing leaf spot (like black spot on roses) |
| Root/stem rot | Bacterial softening of stems and roots | Avoid over-watering and use good sanitation |
| Mosaic yellowing or streaking | Mosaic virus spread by piercing/sucking insects like aphids or thrips | Use an insecticidal soap or proper insecticide to treat insect problem. Discard infested plants |
| Black mold on leaves | Sooty mold caused by aphid honey dew (excrement) | Treat aphids with an insecticidal soap or proper insecticide |

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| Black mold on leaves | Sooty mold caused by aphid honey dew (excrement) | Treat aphids with an insecticidal soap or proper insecticide |
Introduction  Lawns are an important part of the home landscape. A thick, green lawn adds much to the beauty and attractiveness of a house. A healthy lawn requires weekly care from early spring to late fall. During this lesson you will learn about grass varieties, when and how to plant grass seed and maintaining the lawn.

Types of lawn grasses  Lawn grass varieties are classified as warm-season or cool-season. Warm-season grasses, such as bermuda, centipede and Zoysia, grow best at temperatures of 80 to 95 degrees and are dormant during cold fall and winter months. Cool-season grasses include fescues, Kentucky bluegrass and perennial ryegrass. They grow best at temperatures from 70 to 85 degrees and remain green during most winters.

When to plant lawn grasses  Warm-season grasses should be planted from May 1 through June 30. Cool-season grasses are best planted from September 1 through October 1. Most lawn grasses may be established from seed. Lawns may also be established with mature grass using 4 x 4-foot squares of sod or sod plugs (3- to 4-inch circle). These may be put in the ground about 1 foot apart in all directions.

How to establish a lawn:

- Level the soil around the house, breaking up large clumps and removing rocks and debris
- Work the soil when it is dry, then rake the soil level and smooth
- Select the proper seed mix and starter fertilizer (one that is high in phosphate)
- Spread the seed and granular fertilizer as recommended on the bag/container, rake the seed and fertilizer lightly into the soil
- Add a light covering of straw evenly over the seeded area, if no existing grass is present
- Irrigate daily for two to three weeks. The seeds should germinate in five to seven days.
- The lawn will require at least 1 inch of water per week until cold weather.

How to maintain the lawn  Mow the grass at about 3-4 inches in height. Mowing at a lower height may look better, but short grass is more susceptible to dry weather, insects and diseases. Mower blades should be sharp. Mow when the grass is dry. Once the grass is well-established, irrigate to 1 inch of water per week. This recommendation is very important.

Fertilize the lawn with a granular fertilizer high in nitrogen following the recommendations on the bag. Cool-season grasses should be fertilized in September, October and November; warm-season grasses in April, June, July and September.
Summary  Lawns may be difficult to establish. Preparation of the soil area is a key step in establishing a lawn. Proper irrigation and fertilization are very important practices in developing and maintaining a lush, green lawn. Generally, lawns should be established in early fall.

Self check  What is the best mowing height for a home lawn? When is the best time to reseed a cool-season grass like fescue? How much water should you apply to a lawn per week?

OR

Which of these statements are false?
- Warm-season grasses should be planted in spring.
- Cool-season grasses should be planted in early fall.

- Lawn grasses require at least 1 inch of water per week.
- Most grasses should be mowed at a height of about 3–4 inches.
- Mulch with a light covering of straw after grass seeding.
- Grass fertilizers should contain a large amount of nitrogen.

(Note: All statements are true. How did you do?)

Resources. In addition to this lesson, please refer to “Working With the Soil in My Yard,” “Landscaping Tools Needed,” “Plants Need Plants” and “My Landscape Calendar.”
Introduction  All homeowners who have shrubs and trees should know how to regularly prune their plants. This lesson instructs you about why, when and how to prune. Pruning improves the appearance and health of plants and reduces the spread of disease.

Pruning defined  Pruning is the cutting off of unwanted leaves and stems of plants with a sharp tool. There are three types of pruning: hedging, thinning and removal of dead or damaged branches.

Reasons for pruning  The importance of pruning relates to the health and beauty of your landscape plants. The reasons to prune are as follows:

- Improves the shape of the plant; keeps the plant balanced and attractive;
- Reduces the spread of disease by removing dead leaves and branches;
- Improves plant appearance by removing unsightly brown and damaged plant parts;
- Encourages new plant growth.

Time to prune  The best time to prune is in the late fall and winter after first frost. (Warm-ups can stimulate new growth.) Prune dried-up flower blooms, stems supporting flowers and other dead plant parts. The second best time to prune is in spring, as the branch buds swell and show green leaves poking outward. Throughout the year, regularly examine your landscape plants and cut off dead leaves and branches after storms and damage by pets and children’s play.

Tools to use in pruning:
- Small hand pruners; by-pass or anvil
- Loppers; by-pass or anvil
- Usually, by-pass tools will make a cleaner cut

Precautions:
- Always use sharp cutting tools
- Be safe – wear eye protection and gloves
- Dip cutting blades in rubbing alcohol between each cut to prevent the spread of disease.

How to prune:
- Use the 3-step pruning method for large branches.
- Always make clean cuts; avoid ragged or jagged cuts.
- Make all cuts at the upper or outer edge of an outward-facing bud or branch on a stem.
- Make cuts 2 to 3 inches or more closer to the main stem of the plant from the spot of the broken or diseased leaf or branch.
- Never prune more than one-third of the plant at one time. (Remember: leaves and stems are the plant’s food source!)

Pruning with loppers in late fall.  Three-step pruning method
Summary  Pruning landscape plants is an important landscaping best practice. Pruning must be done weekly or monthly, depending on need. Pruning damaged stems and leaves, diseased stems and leaves, and withered plant blossoms needs to be done weekly. Be sure to use gloves and a sharp pruner. Use safe pruning practices.

Self check:
1) Teach a friend to prune a tree or shrub.
2) Create a pruning schedule for your landscape plan using the landscape calendar as your guide.

OR

Examine the landscape each week. Prune all dead blossoms and branches each week. Teach your neighbor how to prune.

Resources. In addition to this lesson, please refer to “Landscaping Tools Needed,” “My Landscape Plan” and “My Landscape Calendar.”
Introduction Record keeping is a necessary and important part of developing a healthy and attractive landscape. Landscape plants are affected by the weather, temperature, amount of rainfall, seasons, angle of the sun, amount of shade and competition from weeds and insects. The timing of landscape care is another factor in plant growth and health. Remember, busy lives encourage forgetting. This lesson encourages homeowners to keep accurate records on the landscapes so the same mistake is not made twice.

Reasons to keep records:
• The landscape is a large investment and needs regular and timely care.
• Record keeping keeps one on schedule and avoids forgetting.
• Records prevent one from making the same mistake twice.
• Record keeping helps to plan ahead and do tasks on time.

How to keep a landscape record Begin with the landscape plan. It should show all plants in the landscape and when the landscape was installed. Also note the date when the lawn was seeded. Use an 8 ½ by 11 inch, 12-month calendar with space to write notes by each date and on the margins (See “My Landscape Calendar”). Each year, start a new calendar and refer back to the previous year. Your notes should help you do tasks earlier, later or the same time, whatever is best for the plants.

Important records to keep:
• Weather conditions: dry, wet, hot, cold and snow. Record dry days between rainfall, which days and the amount of rainfall, the first frost in fall and last frost in spring.
• Note where the sun shines on the landscape in the morning, at noon and in the afternoon. Pay attention how the sun moves as days get longer and shorter.
• Compare the landscape plan (with the plants in the ground): Are the plants getting enough or too much sun? Are the plants getting enough water? Are the plants healthy? When and how did some plants die? Which and how many new plants were added to the landscape?
• Record irrigation (when and how much), mowing the lawn, pruning activity, fertilization (when, what and how much).
• When do the flowers bloom? For how long? What color? What is the bloom cycle?

Summary Successful landscaping requires the homeowner to do various tasks in the right way and at the right time. Keeping accurate daily, monthly and annual records helps to cope with weather and climatic changes. A schedule of regular care insures a healthy and attractive landscape all year long. Checking previous records will help to avoid past mistakes and improve the care of the present landscape.

Self check Write five things happening in your landscape this month. For example: rainfall, pruning of dead limbs or branches, names of plants in bloom.

OR

Begin filling out “My Landscape Calendar” when a Master Gardener helps you install the landscape. Record all that you do in the yard every day. Use the calendar when a Master Gardener does a follow-up visit with you about your landscape.

Resources In addition to this lesson, please refer to “Landscaping Tools Needed,” “My Landscape Plan” and “My Landscape Calendar.”
January
• Spread well-rotted manure around shrubs and trees.  
• Top-dress daffodils with a 5-10-5 fertilizer. 
• Plant and mulch bulbs before mid-month. 
• Feed birds and clean out birdhouses.

February
• Transplant still-dormant deciduous shrubs and trees. 
• Cut a few forsythia or fruit tree stems, put in vase and water for in-house color. Look for blooming hellebores, crocus and daffodils. 
• Prune summer-flowering woody ornamentals like butterfly bush, hibiscus and rose of Sharon. 
• Remove invasive vines/shrubs like honeysuckle, trumpet creeper, poison ivy and privet. 
• Plan vegetable and summer flower garden.
### March
- Fertilize trees and shrubs later in the month.
- Cut back ornamental grasses to just above their growing crown.
- Divide and transplant clumping perennials such as daylily, hosta, iris and liriope.
- Seed cool-season greens, onion sets, beets, carrots and radish.

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**Follow-up comments from Master Gardener**  
**Reminders for next year**

### April
- Prune spring-flowering shrubs like forsythia and lilac two to three weeks after last petals have dropped.
- Continue planting cool-season vegetable seeds.
- Edge your garden beds.
- Fertilize and prune azaleas back into shape after they have finished blooming.

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May

- Irrigate the landscape to 1 inch per week.
- Deadhead or prune back spent flowers in your perennials to stimulate reblooming.
- Remove bulb foliage at the end of the month.
- Harvest cool-season vegetables and plant corn and beans; transplant tomatoes, peppers and eggplant.

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June

- Irrigate the landscape to 1 inch per week.
- Mulch vegetable and annual beds with straw or wet newspapers.
- Harvest and enjoy vegetables and flower blooms.
- Weed the landscape at least once per week.
- Patrol and collect Japanese beetles and squash bugs; put them in a mixture of dish soap and water.

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**July**

- Irrigate the landscape to 1 inch per week. Weed each week.
- Continue to deadhead flowers; prune any broken or diseased branches on woody ornamentals and trees.
- Clean and keep fresh bird baths.
- Reduce mosquito populations by finding and draining sources of stagnant water.

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**August**

- Fertilize azaleas, rhododendron and laurels by mid-month with an acid-based soluble fertilizer containing iron.
- Irrigate the landscape to 1 inch, especially container plants.
- Weed each week; destroy all weed plants and seeds.
- Keep feeders full during hummingbird migration.
- Photograph garden for pleasant memories and planning for next year.

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**September**
- Irrigate the landscape to 1 inch per week; weed weekly.
- Plant pansies, snapdragons, ornamental kale and cabbage in the landscape.
- Plant cool-season vegetable seeds and plants.
- Divide and transplant perennials.

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**October**
- Plant and mulch trees and shrubs.
- Plant and fertilize spring bulbs.
- Dig and store caladium, gladiolus, dahlia and tuberous begonia.
- Rake, collect and destroy dead and/or diseased plants or pruned material all through the landscape.

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### November
- Cut back dead and dying foliage of perennials.
- Rake, collect and destroy all spent annuals, pruned perennials and damaged tree and shrub limbs.
- Mulch all the flower and perennial beds.
- Feed the birds.

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### December
- Empty or protect soil in containers.
- Clean, sharpen and oil garden and landscape tools.
- Collect greenery from the landscape for holiday decorating.
- Feed the birds.
- Evaluate the best and worst parts of your landscape for the year.

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Follow-up for HUG Landscapes

Date of landscape planting: ________________

Date of follow-up observations:
Visit 1 ________________
Visit 2 ________________
Visit 3 ________________
Visit 4 ________________
Visit 5 ________________

Are you happy with your new landscape? Does it meet your expectations?

What care was given the landscape since the planting date? What other work was done in the landscape?

What additions were made in the landscape? Name plants and locate on landscape plan.

Describe the condition of the landscape. List weak, diseased and dead plants.

Were any plants moved or removed? If so, which ones? Why? Describe.

List tools/equipment owned and used by the homeowner:

What problems have you had with maintaining your landscape?

Do you have plans to expand the landscape? If so, describe.

What else can we do to help?

A Master Gardener will contact you in advance. Please give him or her a time that is most convenient for you (evenings or Saturday mornings). You should have your “My Landscape Plan” and “My Landscape Calendar” available for each visit.

Master Gardener’s name: ____________________________________________________________

Phone: __________________________________________________________________________
References
Supplemental HUG Handouts:
HUG Brochure
Plant Inventory in the HUG Nurseries
HUG Landscaping Day Plan

Books
New Illustrated Guide to Gardening, Readers Digest Editors

American Horticulture Society Encyclopedia of Gardening, DK Publishing

Southern Living Gardening Book, Steve Bender

UT Extension Publications:
http://www.utextension.utk.edu/publications/homeGarden

Resources
County Extension Office:
For local contact information visit
http://www.utextension.utk.edu/offices
or check local phone listings for
UT Extension Office

Garden Centers and Nurseries

Local Public Library