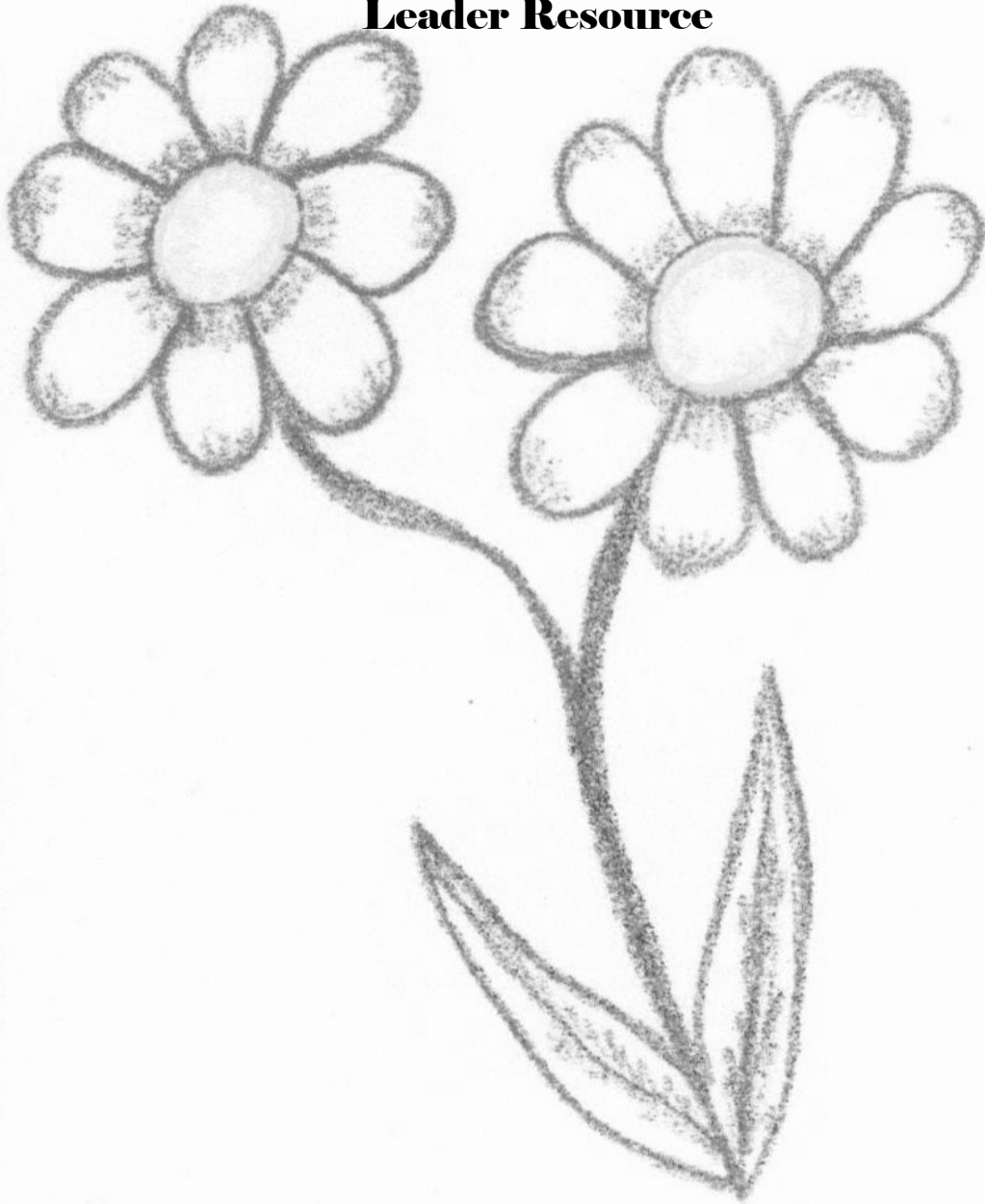


Floriculture

Leader Resource





WELCOME

Welcome to the 4-H Floriculture Project! Please read through this Guide carefully, as it contains information and suggestions that are important for your project. **4-H leaders can obtain a Leader Project Guide and other resources from the PEI 4-H Office.** Hopefully you, as a member, will “Learn to do by Doing” through hands-on activities that will encourage learning and enjoyment. If you have any questions, contact your District 4-H Officer or your 4-H project leader.

4-H YEAR COMPLETION

You complete a project by:

- completing the project Achievement Day requirements
- completing a communication project
- completing a community project
- completing an agriculture awareness project
- taking part in Achievement Day

You must complete all of the listed aspects in order to show at Fairs and Exhibitions.



ACHIEVEMENT DAY REQUIREMENTS

(Rural Youth Fair will be the Achievement Day for Floriculture Project)

Leader’s Inspection	10
Poster	15
Special Project	15
Garden Plan	15
*A display box/container (maximum size 3’ x 3’) and a flower arrangement (either fresh or dried).	<u>45</u>
	100

Each member’s project work will be evaluated on quality of flowers, items exhibited, presentation, or the way they are displayed and whether all of the requirements are met.

*Junior Members (ages 9 - 14)

Must grow and exhibit 3 - 5 types of flowers (annuals, biennials or perennials), planted in a display box/container, and one flower arrangement

*Senior Members (ages 15 - 21)

Must grow and exhibit 4 - 6 types of flowers (annual, biennials or perennials), planted in a display box/container, and one flower arrangements.

NOTE: This project is considered a “*Spring Project*”, and differs from other projects in that it is not completed at your Club Achievement Day because your flowers may not be ready until early September. You will be presented with your 4-H certificates and ribbons after the Rural Youth Fair.

EXHIBITION REQUIREMENT

Poster

Except at Rural Youth Fair where the flower box/container and flower arrangement will be the exhibition requirement.

Please Note!

Members taking the Floriculture Project will display their poster at their club's Achievement Day. The poster will be the Exhibition Requirement for all exhibitions EXCEPT the Rural Youth Fair. At the Rural Youth Fair, members must exhibit their poster, a report on their special project, the garden plan and the flower box/container and flower arrangement.

Leaders will contact the Provincial 4-H Office previous to the Rural Youth Fair with a mark for Leader's Inspection.

While all of the above are all necessary and must be marked at Rural Youth Fair in order to complete the Floriculture Project, for actual class judging at Rural Youth Fair, the flower box/container and flower arrangement will be the items judged.

Special Project (15 marks)

(Achievement Day Requirement)

There are many exciting activities that can qualify as your special project. Here are some examples:

- Take a trip to a florist or garden center.
- Plant an outdoor garden as a group.
- Work in a garden in your community.
- Prepare a weed collection.
- Make a corsage or boutonniere
- Any other trip or activity that will help members to learn about growing plants!

Flower Garden Plan (15 marks)

(Achievement Day Requirement)

Prepare a plan for a flower garden. Be sure to consider sunny and shady areas, existing buildings, trees, etc, and the size, height and color of the flowers you would like to plant. Your plan should be drawn on a 1/2 sheet of Bristol board and it should be as colorful and creative as you can make it!

Leader Resource

There is a resource book available for the project leader that can be picked up at the P.E.I. 4-H Office. This book contains information on planting and caring for houseplants, garden planning, and flower crafts. It also contains different projects that can be completed as a special project such as flower arranging and planting outdoor gardens.

Exploring Plants and Soils

Plants are an important part of our ecosystem. Plants grow by using sunlight and water, plus nutrients and minerals from the soil. In turn, plants provide food for humans and animals, beautiful flower gardens and much more. This project will explore how plants grow, parts of plants and flowers, and the importance of the soil.

How Plants Grow

Plants make sugar by using energy from the sun, carbon dioxide (from the air) and water (from the ground), through a process known as photosynthesis. The sugar that is produced, $C_6H_{12}O_6$ is used as food for plant growth.



Positive Factors That Affect Plant Growth

Many factors affect how a plant will grow. The most important include:

1. Amount of sunlight
2. Proper amount of water
3. Proper temperature
4. Good soil

Negative Factors That Affect Plant Growth

There are also factors that can inhibit plant growth. These include:

1. Insects that damage plants
2. Wildlife that eats leaves or entire plants
3. Diseases
4. Poor soil condition

Plant Propagation

Plant propagation means increasing the number of new plants from plants that are already living. This is done so new generations of the species will keep on being produced. It can be done in two ways:

1. By using seeds. This is called Sexual Propagation.
2. By using parts of plants such as leaves, stems, roots, etc in order to grow new plants. This is called asexual or vegetable propagation.

Soil Types

The outer layer of the earth's surface is called soil. We are dependent on this layer for plant growth. Soil stores the nutrients, minerals and water that plants take in through their roots to enable the plants to grow.

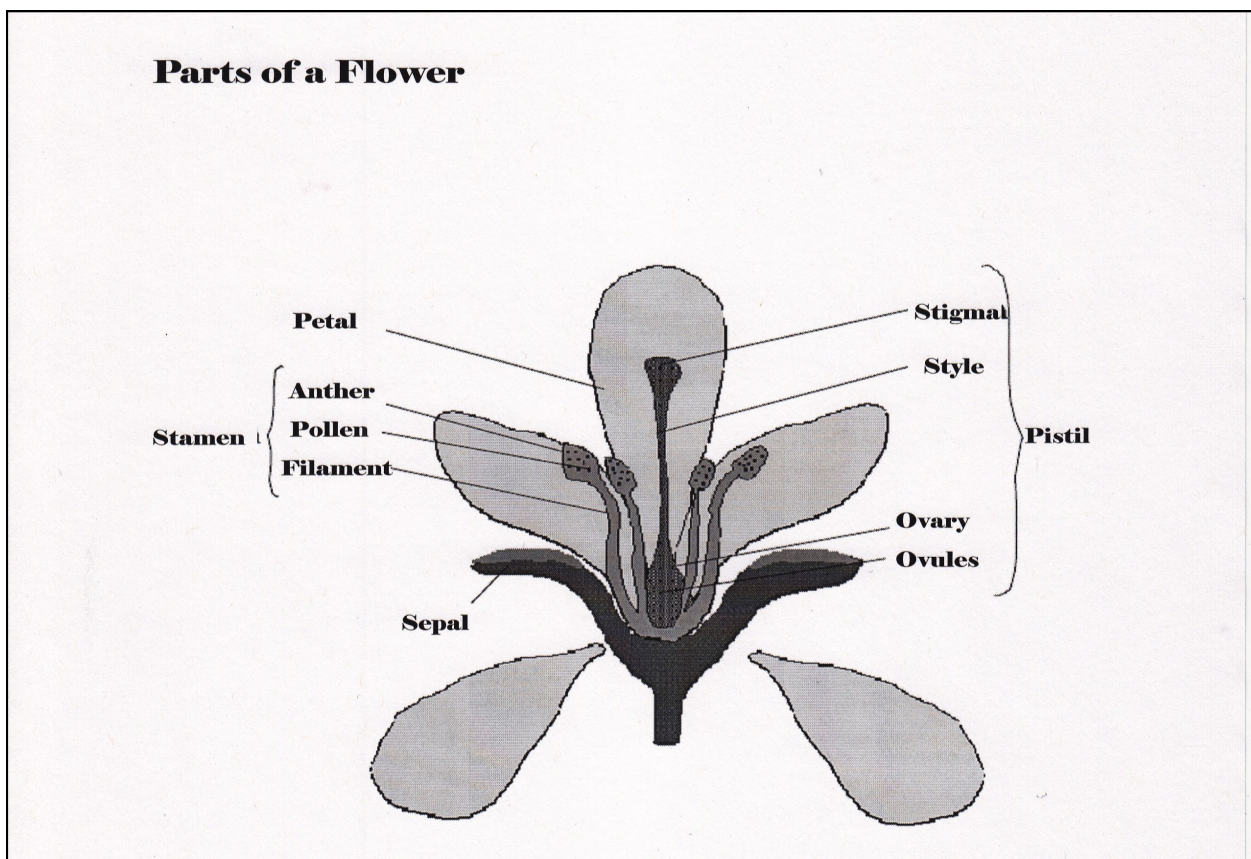
Soil is made up of three types of particles - sand, silt and clay. These parts are different because of their size. A clay particle is the smallest, followed by silt, and the largest is sand. Soil characteristics such as texture, drainage, and ability to hold nutrients vary according to the balance of sand, silt and by in the soil.

The three most common soil types are:

1. Sandy - easily tilled, excellent drainage, low in organic matter
2. Clay - very heavy, poor drainage, holds nutrients well
3. Loam - easily tilled, good drainage, an even balance of sand, silt and clay.

Soil Factors That Affect Plant Growth

1. Organic Matter
2. pH- Acidity
3. Nutrients



WEED COLLECTION

(Suggestion for Special Project)

Start a weed collection from your flower garden of weeds at the seedling stage and have your leader help you identify them. The seedlings may be easily pressed between the pages of an old catalogue or phone book. Lay them out flat, carefully close the pages of the book over them so as not to disturb them and weight the book down with other heavy books. The seedlings will be dry and ready for mounting in a few weeks.

For display at Achievement Day...

Select three pressed weeds, mount and identify them. To keep your specimens from bending and breaking, mount them on a piece of stiff cardboard. You can cover them with a plastic protective page or wrap the cardboard with plastic cling wrap.

GARDEN INSPECTION (15 marks)

(Achievement Day Requirement)

Keep your garden area neat. Remember there will be a surprise inspection of your garden during July or August. This inspection by your leader is worth 15 marks towards your final project mark.

Your leader will be looking for the following during the inspection...

- Neatness, attractiveness of the plot (might include sign, border)
- Freedom from weeds and disease
- Productiveness as shown by good growth of plants, health of plants and uniformity of garden
- Garden plan and arrangement of vegetables, location of the garden and convenience

POSTER

(Achievement Day Requirement)

Topics might be

1. Parts of a plant
2. Life cycle of a plant
3. Starting plants indoors
4. Types of flowers
5. Topic of your choice

Be sure to

- Use "4-H Poster Book" as your guide
- Use a whole sheet of Bristol board, photo mount board, or display board (approximate size 22" x 28")
- Use quality, not quantity information
- Use your imagination, drawings or pictures and creativity
- Write your name, club and age on the **back**,

DRYING FLOWERS

Fall is a good time to begin drying flowers, seedpod and ornamental grasses for later use in indoor arrangements.

Steps to follow:

1. Gather the flowers at midday when the humidity is lowest. Pick some buds as well as flowers almost at peak bloom. Avoid fully opened flowers as they do not last long when dried.
2. Strip the leaves from the flower stems, tie the stems in small bunches and hang them upside down in a dark, dry place with some circulation of air. Flowers will be dry in three weeks if conditions are right.

Good choices for drying include artemisia, baby's-breath, Bells of Ireland, Celosia, Chinese Lantern, Delphinium, Globe Amaranth, Globe Thistle, Heather, Hydrangea, Larkspur, Lunaria, Blue Salvia, Annual Statice, and Yarrow. Strawflowers should be snapped from their stems and when their buds are half open.

Ideas for Dried Flowers: Wreaths, Bouquets, Swags, and Centerpieces

Pressing Flowers

Achievement Day Requirement

You can also create a craft using pressed flowers for you Achievement Day Requirement. To press your flowers simply pick the ones you would like to use, and flatten them between two books for about a week, or until they are dry. You can then use these flat flowers to make cards, picture frames and anything else you can think of.

Please Note...

You can dry and use any flowers that you wish for your dried or pressed flower craft.

Trip to the Florist/Garden Center

Taking a trip to visit a Garden Center or Florist will give you a chance to become familiar with many different plants and flowers. It will give you an idea of what plants you would like to put in your garden plan, and you can purchase your bulbs/seeds for the indoor plant you want to grow for your project.

All flowers exhibited in the display box/container must be grown in the member's flower garden. Display box/container arrangements cannot use wildflowers or any accessories such as candles, ribbons, rocks, driftwood, figurines, etc. Accessories and labels (cards, shells, frames, etc) are acceptable in the actual display box, but not in the arrangements.

Members may exhibit any annuals, biennials and/or perennials if they have been grown in the member's garden and the required number is five (5) blooms or three (3 stalks) of each flower.

Members may use greenery from their flower garden, vegetable garden or that occurs naturally in PEI for use in the display of and arranging flowers. Members are encouraged to use such things as flower foliage, carrot tops, moss and wild ferns.

House plants can include succulent plants.

PROJECT MEETINGS DIARY

Most projects will require at least six to eight project meetings to complete the project.



Meeting Date	Location	Time	At this meeting, we...

PROJECT ENROLLMENT DIRECTORY

From time to time throughout the 4-H year, you may wish to contact your leader(s) or another project member for one reason or another. Just fill in the information below, and you will have a handy Project



MEMBERS' NAME	E-MAIL	PHONE NUMBER
LEADERS' NAME	E-MAIL	PHONE NUMBER

Community and Agriculture Awareness Projects

COMMUNITY PROJECT

Each year you are encouraged to provide a service to your community as a 4-H member. This introduces you to the responsibilities of citizenship. You must participate in your club's plan for a community project and you should have a role to play. Describe your involvement with your club's community project this year.



Our Community Project was _____

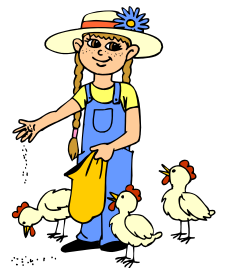
I helped by _____

It was beneficial because _____

I learned _____

AGRICULTURE AWARENESS PROJECT

Agriculture is one of PEI's main industries. You are expected to participate with your club to complete a project (or provide a service) which helps your club or others become aware of the importance of agriculture in our lives. As in the community project, you should actively participate.



Our Agricultural Awareness Project was _____

I helped by _____

It was beneficial because _____

I learned _____

Content

Section I: Exploring Plants and Soil

Section II: House Plants

Section III: Outdoor Flower Gardens

Section IV: Flower Arrangements

This book is a guide for leaders who are teaching the Floriculture project. It contains information and activities that can be used to help educate members and complete project requirements



Section I

Exploring Plants and Soils

Plants are an essential part of our ecosystem. Plants grow by using sunlight and water, plus nutrients and minerals from the soil. In turn, plants provide food for humans and animals, beautiful flower gardens and much, much more. This unit explores how plants grow, parts of plants and flowers and the importance of soil.

How Plants Grow

Plants make sugar by using energy from the sun, carbon dioxide (from the air) and water (from the ground), through a process known as photosynthesis. The sugar that is produced, $C_6H_{12}O_6$ is used as food for plant growth.

Positive Factors That Affect Plant Growth

Many factors affect how a plant will grow. The most important include:

1. Amount of sunlight
2. Proper amount of water
3. Proper temperature
4. Good soil



Negative Factors That Affect Plant Growth

There are also factors that can inhibit plant growth. These include:

1. Insects that damage plants
2. Wildlife that eats leaves or entire plants
3. Diseases
4. Poor soil condition

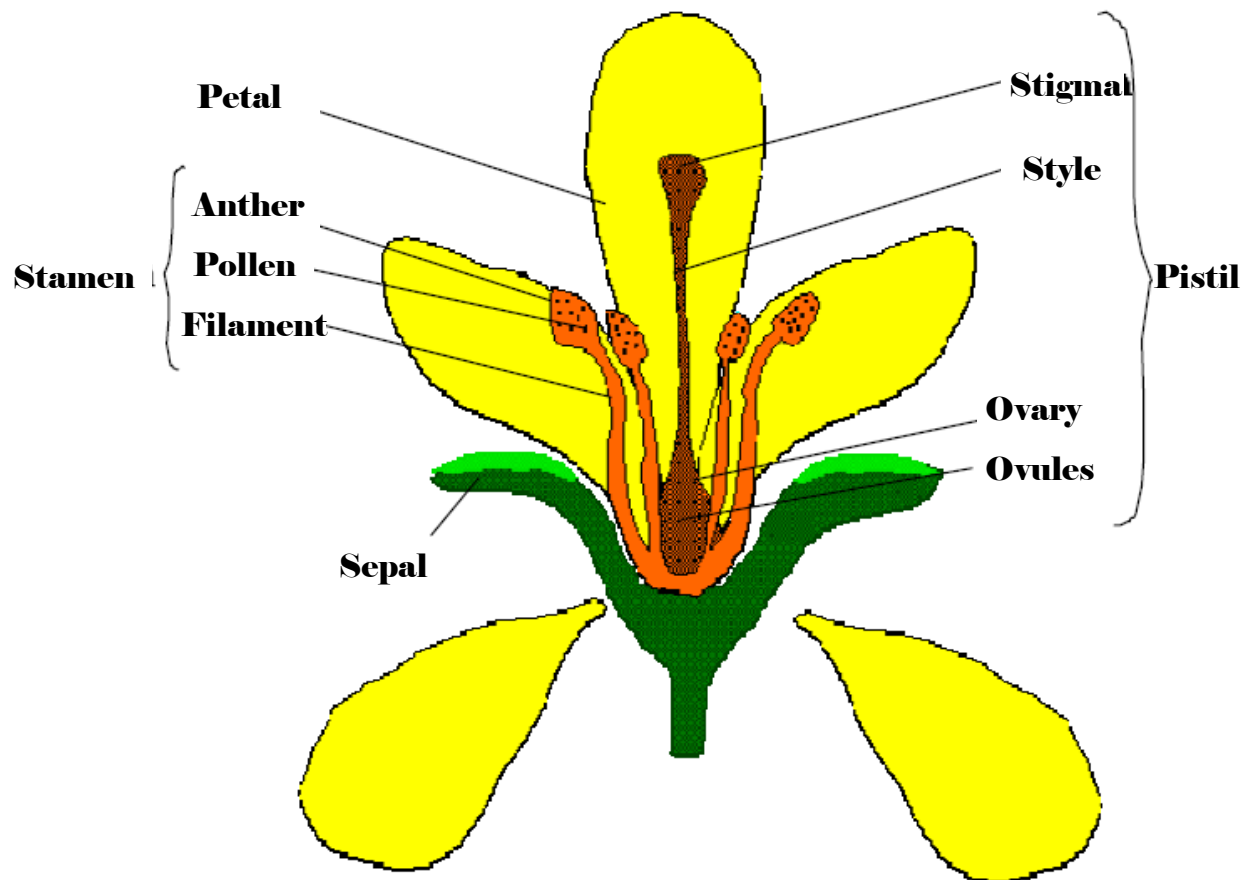


Plant Propagation

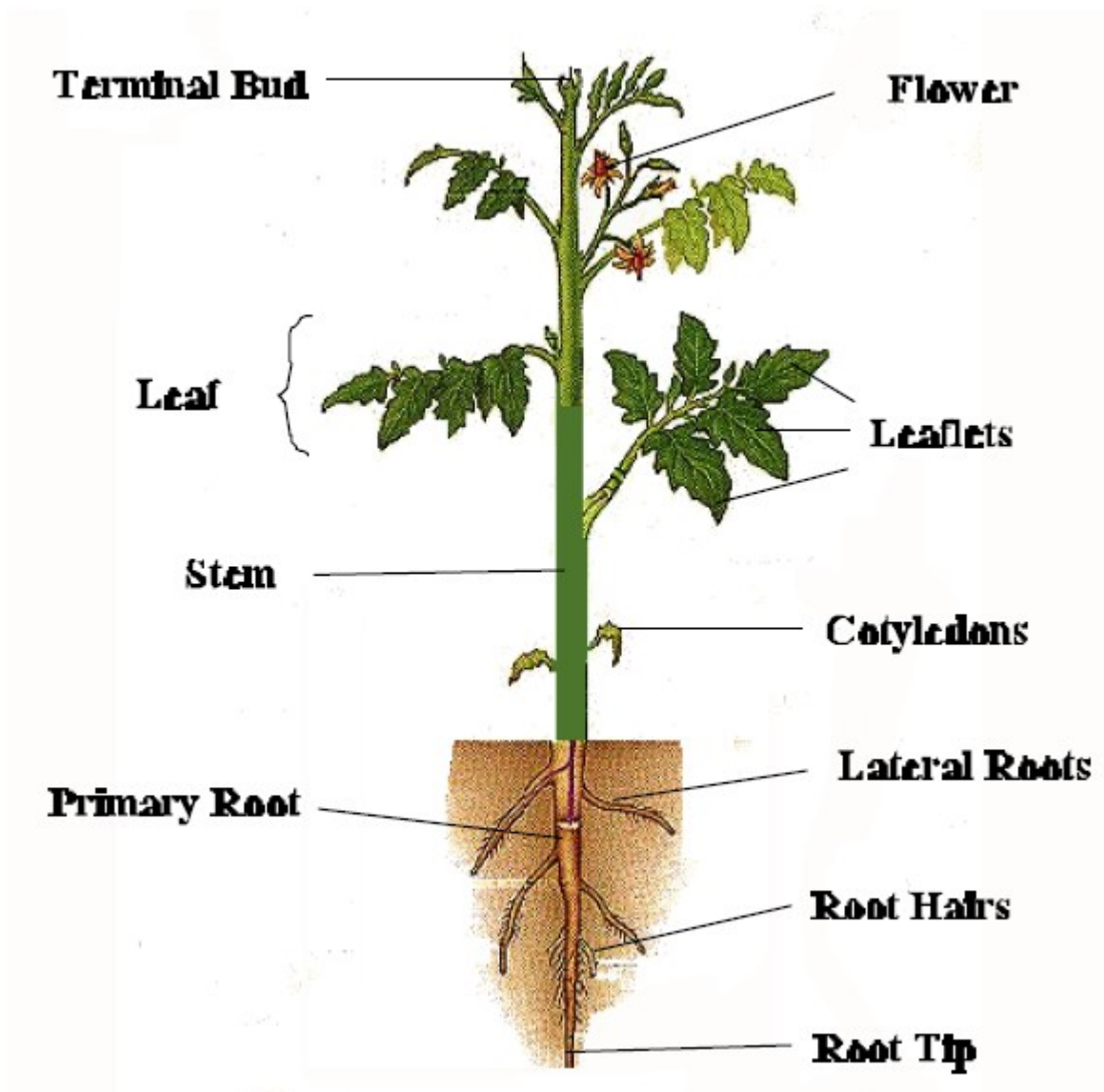
Plant propagation means increasing the number of new plants from plants that are already living. This is done so new generations of the species will keep on being produced. It can be done in two ways:

1. By using seeds. This is called sexual propagation.
2. By using parts of plants such as leaves, stems, roots, etc. in order to grow new plants. This is called asexual or vegetable propagation.

Parts of a Flower



Parts of a Plant



Soil Types

The outer layer of the earth's surface is called soil. We are dependent on this layer for plant growth. Soil stores the nutrients, minerals and water that plants take in through their roots to enable the plants to grow.

Soil is made up of three types of particles - sand, silt and clay. These parts are different because of their size. A clay particle is the smallest, followed by silt, and the largest is sand. Soil characteristics such as texture, drainage, and ability to hold nutrients vary according to the balance of sand, silt and clay in the soil.

The three most common soil types are:

Sandy - easily tilled, excellent drainage, low in organic matter

Clay - very heavy, poor drainage, holds nutrients well

Loam - easily tilled, good drainage, an even balance of sand, silt and clay.

Soil Factors That Affect Plant Growth

1. Organic Matter
2. pH- Acidity
3. Nutrients

Organic Matter

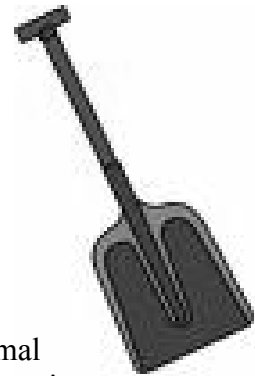
Organic Matter is made up of various forms of living and dead plant and animal material. Soil life including soil animals and microbes digest (decompose) organic matter such as leaves, weeds, etc. and the final product is called humus. Humus contains nutrients in a form that can be taken up by plants. Two common ways of increasing the organic matter content in your soil are to add peat moss or compost.

Compost is often called "Gardener's Gold" since it is an excellent way to enrich the soil. Composting is the process where organic materials decompose to form a product similar to soil humus. It speeds up the natural decomposition process by providing ideal conditions for decay.

Backyard composting is becoming increasingly popular in recent years since it is an environmentally friendly way of disposing of some types of household and yard waste.

The six requirements for successful composting include:

- Microorganisms and/or worms
- Water
- Air
- Nutrients
- Heat
- Time



pH - Acidity

The “pH” of soil refers to its acidity or alkalinity. The pH scale goes from 0 (very acid) to 14 (very alkaline). A pH of 7.0 is neutral. An acidic soil (pH of less than 7.0) is less productive for most crops, but can be improved by adding limestone. Lime is alkaline, and will therefore raise the pH of the soil. Lime should be applied before fertilizer. This corrects the soil pH first, allowing fertilizers to be more effective.

Nutrients

Soil contains a wide variety of nutrients that all help in growing plants successfully, including nitrogen, phosphorus, potassium, calcium and magnesium. A soil test will analyze the nutrients in your soil sample and give recommendations of what (if any) additional nutrients are required for the type of the crop you want to grow. Nutrient levels can be increasing by adding fertilizers.

Types of Fertilizers

Fertilizers can be either natural sources (organic fertilizers), or man-made formulations (commercial fertilizers).

Organic fertilizers include animal manure and compost. These types of fertilizers can be tested to determine the nutrient content. Organic fertilizers also benefit the soil by increasing the organic matter content.

Commercial fertilizers are those which are formulated to contain specific levels of nutrients. These are available in a wide range of products, such as tablets, liquid, granular, or slow release. Each different type of fertilizer has recommendations on how it should be used, quantities, when and how to apply it to the soil, etc., so it's really important to read the container labels to ensure the fertilizer you are purchasing is best suited for your soil type and crop.



N-P-K Fertilizers

There are a wide variety of fertilizers available, each with a specific nutrient content. On most fertilizer packages, you'll see a set of three numbers such as -

10-10-10

6-12-12

5-10-5

These numbers indicate the percentage of the three most important soil nutrients in the fertilizer you have purchased.

Nitrogen (N) - Phosphorus (P) - Potassium (K)

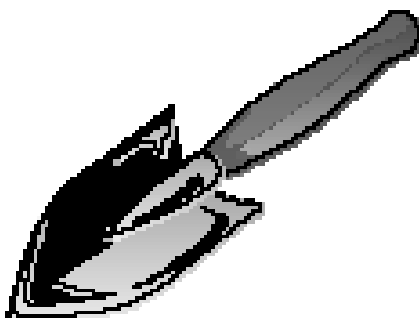
For example, if you purchased 6-12-12 fertilizer, 6% would be nitrogen, 12% would be phosphorus, 12% would be potassium, and the remaining 70% is a filler such as sand.

These three nutrients are the major nutrients required for plant growth.

Nitrogen (N) is necessary for protein production in plants, growth of leaves and stems, and for photosynthesis.

Phosphorus (P) is required for respiration, photosynthesis, and enzyme reactions in plants.

Potassium (K) is necessary for the manufacture and storage of protein and carbohydrates.



Section I

Activities

1. Choose a plant in your home or yard and identify the parts of the plant using the diagram in this section.
2. Look at a flower in your home or yard and identify the parts of the flower using the diagram in this section.
3. Prepare a poster on photosynthesis. Find out as many details as you can on how a plant converts sunlight, nutrients and water into food for its growth.



Section II *House Plants*



GENERAL CARE OF HOUSE PLANTS

In order to be successful with your plants you must learn what it takes to keep them healthy. Find out what your plant needs in the way of light, soil, drainage, plant food, temperature, humidity and watering, rest period, summer and winter care, and repotting. You must practice good housekeeping habits which prevent disease and pests.

House plants will from time to time require **repotting**. This mainly consists of being taken out of the pot and transferred to one of the next largest size, (e.g. from a four inch pot to a five inch one). The pots should be clean, and if made of clay should be soaked for at least 24 hours.

To remove the plant from its original pot, turn it upside down and tap the rim on the edges of a bench. It can then be taken out very easily this way. To repot, put some broken pot or coarse gravel in the bottom, for drainage, and using sterilized soil, transfer the plant to its new pot. Water well and place in its former location.

House plants need to be **pinched and pruned**. Pinching means taking the growing point of the plant out so that the plant will branch. Pruning means cutting back the branches to keep the plant small and bushy.

Plants, like animals, need to be fed. If a liquid **fertilizer** is used it is recommended that you add one teaspoon of it to a six inch pot. If the fertilizer is supposed to be mixed with water first, you usually add two tablespoons per gallon of water to make the solution. (Check the directions on the package to see what is best for your specific type of plant.)

Most house plants do well at a night **temperature** of 13°C to 18°C and a day temperature of about 5°C higher. Some plants like higher temperatures than this while others like lower temperatures. An example of the latter is cyclamen, which likes it very cool, at about 10°C.

Most plants require a lot of **light** in order to grow. The amounts of direct sunlight a plant needs depends on what type of plant it is. Plants which flower should be placed in a sunny south window, and plants which are mostly foliage like an east window best. West windows receive a lot of afternoon sun. This is often too much light so you must be very careful if you place plants there. North windows do not get enough sunlight for flowering plants, but some foliage plants can be placed there.

It is often hard to tell when a plant needs to be **watered** and how much it should be given. It is a fact that more plants are killed from being given too much water than not enough water.

Plants which grow fast, bloom and have lots of foliage need more water than plants which are not in bloom. Cacti need very little water as well as all the other plants which have a small root system. Remember that clay pots dry out more quickly than plastic pots and that a sandy soil will dry out more quickly than a clay soil. On warm, sunny days plants will use a lot more water and dry out faster than on cold, cloudy days.

Some growers water their plants from the top and others like to water theirs from the bottom. Both of these methods work well. If a plant is watered from the bottom, it is placed in a pan of water which is about one half of the size of the pot and is left there until the grower can see that the top of the soil in the pot is moist. Then it is taken out of the pan of water and allowed to drain. The grower should always let the soil dry out before he/she waters the plant again.

Keep The Plant Foliage Clean

Everyone who uses house plants for decoration wants them to look as nice as they can. The foliage of plants can be kept looking good if warm soapy water is sponged, rubbed or sprayed on the plant once every two weeks. This removes the dust. It should be done to all plants except ones which have small, delicate, or hairy leaves (such as African violets). Add a small amount of soap powder in one gallon of water. Make sure the soap dissolves. If you use a liquid soap, then only use half as much when you add it to the water. You should place a piece of paper over the soil in the pot so that extra water and soap suds do not sink into it. Always allow plants which have just been washed to dry in the shade, **NOT** the sun.

Plants which have hairy leaves (African Violets, Gloxinias, and Pic-A-Back plants) may be dusted by using a soft brush dipped in warm water (water which is room temperature).

The Control and Prevention of Pests

If plants are washed at least every two weeks and are given proper amount of sunlight and nutrients, and are grown in a sterilized mixture of soil, they should not have insects on them. All new plants must be examined carefully. If they do have insects on them, they must be treated right away so that the pests do not begin to bother other plants. If you keep a close watch on your plants, you should not have very much trouble.

The following pests are insects you may have to deal with: aphids, mealybugs, white flies, scale insects and red spider mites.

Aphids are plant lice. They are usually found on plants which have been outdoors for the summer. They suck juices from the tips and young leaves of plants. The soap bath is a good idea if there is not very much lice. If there is a lot of lice, the plant should be sprayed with (1) nicotine sulfate or (2) a prepared commercial insecticide for household use (follow directions on container).



Mealybugs have flat, white, oval bodies. They are sometimes found on cacti, African violets, coleus, fuchsias, gardenias and other plants. The soap bath or a spray with clear water should control them. If it does not, the leaves of the plant should be wiped with alcohol on a small brush or cotton swab. If there are not very many eggs, they can be taken off with a small brush, cotton swab or a toothpick. Each of these tools should be dipped in alcohol first.

White Flies are tiny bugs that dart away if the plant they are on is disturbed. They are hard to control. If a plant is infected by white flies, the plant should be sprayed every 4 - 5 days with an insecticide and water solution or a rotenonepyre spray. If there are a lot of bugs, the plant should be sprayed every day until the insects are gone. If there are not very many insects, the plant should be sprayed once every 4 - 5 days with a nicotine-soap solution (the same that was recommended for aphids).



Red Spider Mites are usually found in atmospheres which are hot and dry. If the leaves of a plant start to turn gray or have yellow spots on them, it may have red spider mites on it. The mites weave tiny webs on the leaves. If the plant is washed every day and the moisture in the air is increased, the mites should all die. Dusting the leaves with sulphur will also help.

Scale Insects are sometimes found on the leaves and stems of ivy and ferns. They have flat, round, oval bodies. When they are full-grown, they are covered with scales. These scales protect the insect from sprays which you may use. The insects must be removed with a soft brush, cloth, or sponge soaked in warm, soapy water. When the insects are still young and do not have their scales, they can be removed by a water spray.

Fungus Diseases, Mildew, Wilt and Rot

House plants which are grown in the home are not usually bothered by these problems because their environment is usually warm and dry. When fungus does grow on plants, they should be treated with fungicide. If a plant wilts or rots, you should remove the parts which have been damaged. You may be over-watering the plant.

The diseases which attack foliage plants are divided into three groups. These are as follows:

- a) diseases that affect the foliage
- b) diseases that affect the stems, and
- c) diseases that affect the root system

SOIL MIXES

One of the first considerations when you are growing house plants is what type of soil mix to use. The soil that comes from a garden or field contains too much clay and is not suitable for plants in pots. So, you can prepare your own mix or buy potting soil.

To prepare your own potting soil:

A good mixture for growing seedlings is equal amounts of garden soil, peat moss, and sand combined together. Loam or rotted sod provides plant food and peat moss will help keep the soil from caking or packing. Sand is added to this mixture to make it porous.

The mixture should be sterilized with steam and then sifted through a 1/4 inch sieve. This will help to get rid of weed seed organisms which produce disease, and any large particles that might interfere with the growth of the seedlings.

Then, you will need a fertilizer to help the plants grow. Plant food can be obtained in the liquid or tablet form. It is best to buy a slow-release plant fertilizer. This will provide the plant with food over some time. Bone meal can be added in order to supply phosphorus.

If you are using commercial potting soil for house plants, take note of the fact that there is only enough fertilizer for approximately three weeks. You will have to fertilize at least once a week. It can be slow release liquid.

Soil mixes for house plants:

Cactus-Succulents:

1 part loam soil
1 part coarse sand

Foliage Plants:

3 parts loam soil
1 part peat moss
1 part perlite

African Violets:

3 part loam soil
2 parts peat moss
1 part perlite

Plant Containers for Houseplants:

Pots used for growing plants may be containers made of glass, rubber, plastic, tin or wood. Many people prefer clay pots. They are porous, which means that the plant can “breathe” through them. However, plants growing in these containers need to be watered more as water evaporates more readily. They are also easy to break. Plastic pots are easier to water and to handle and are light weight.



Winter Houseplant Care

Here is a checklist of things you can do to help your plants weather the winter:

- Raise the humidity level. Most houseplants are tropical or subtropical and require a humidity level of 30 to 40 percent. Your home may have a humidity of only 10 percent or less when the temperature outdoors is 10 degrees or below. A humidifier is the ideal way to raise your home's humidity to the level plants need, but there are other steps you can take to raise the humidity around your plants. Daily misting helps. Small plants can be grouped on a tray of moistened pebbles. Set pans of water by heat registers and if you don't mind company when you shower, bring your plants into the bathroom with you so they can share the benefits of the steam.
- Some cactus and succulents go dormant in the winter so the amount of water should be reduced. Some foliage and flowering plants require less moisture also.
- Check plants that you've summered outdoors for signs of pests and treat infested plants before relocating them indoors. Replace the soil in the pot you used while outdoors with new potting soil.
- Remember, the southern light is much stronger now and the northern light is much weaker, so move your plants to positions where they can get proper light.
- Stop fertilizing blooming plants and others that need a winter rest period. Your ferns and foliage may also get along with less fertilizer.
- Move all plants away from heat registers. During the summer when the furnace isn't running there is no problem, but in the winter, the hot, dry air from the register can have a disastrous effect on your plants.
- Dust plants with a soft, moistened cloth when dust builds up. Wipe only the top sides of the leaves (the pores the plant "breathes" through are located on the undersides of the leaves). Wipe gently so you don't damage tender plant tissue.

Vegetative Propagation of House Plants

This means growing new plants from parts of plants such as the leaves, stems and roots. This is necessary if plants that are identical to the parent plants are going to be reproduced.

Division or Splitting:

Many house plants can be propagated (reproduced) by taking them out of their pots and separating the roots into different parts. African violets, ferns, chives, parsley and others can be propagated in this way.

Cuttings:

A cutting is a piece of a plant which has been taken from the parent plant (a stem, leaf or root). If it is given the right amount of light, water and minerals, it will grow into a new plant just like the parent plant. This method is a good way of increasing the number of house plants you have and is cheaper than buying new ones.

(a) Stem Cuttings

Stem cuttings are taken from the side branches of healthy, stocky plants. A diagonal cut is made at both ends of the section of stem you wish to take. Cut out a section of 7.5 - 10 cm (3-4") for your cutting. Each cutting should have at least two nodes. Nodes are the places on a stem where branches and leaves are attached to it. The cut should be made just below a node. Philodendron, poinsettia, geranium, and chrysanthemum can be reproduced in this way.

All cuttings should be placed in a mixture where they can root as soon as possible after they have been cut. The lower leaves of the cutting should be removed and it should then be planted in a hole five cm (2") deep.

The cuttings can be rooted in a mixture of sand and peat moss, or vermiculite and perlite. After you have taken your cuttings you will have to be careful not to let them dry out. A plastic bag fastened over the container holding the cuttings will act as a mini-hothouse. Rooting will take place in three to four weeks.

After rooting has taken place, the cutting should be carefully removed and potted in a mixture of equal amounts of loam, peat moss, and sand. Or, you can use ordinary potting soil. Water and place the plant in a shady place for a few days before it is brought into sunlight. It is recommended that the growing point be removed. This will induce side branching, resulting in a bushier and more shapely plant.

(b) Leaf and Leaf Bud Cuttings

This is a very popular method to use because it is simple. A leaf cutting is a whole leaf or a part of a leaf with or without its stalk. Take a mature leaf with stem from the parent plant and place it in a mixture where it can root (loam, peat moss and sand). Be sure that you keep the cutting warm and moist. Do not let it dry out. Roots should form in 2 - 4 weeks. Transplant the leaf cuttings the same way as you transplanted the stem cuttings. A leaf bud cutting is made up of a leaf, a portion of the stem, and a petiole (the stalk that attaches the leaf to the stem). The bud which is in the centre of the leaf grows into the new plant. This cutting is treated the same as the stem cutting and the leaf cutting. Begonias, African violets and peperomia are reproduced by leaf cuttings.

Forcing Bulbs

Forcing simply means hurrying the plants into flower placing them in warm temperature.

Forcing Bulbs can be an interesting and very rewarding project. The most common bulbs forced are hyacinths, tulips and daffodils. Chichory can also be forced. The bulbs must be obtained in the fall and planted in five, six, or seven inch pots or pans using good garden soil or even peat moss. They should be placed close together in the pot and deep enough to be covered completely with soil.

After a thorough watering, the pots should be buried in the ground outdoors, about 18 inches deep, and then covered with a one inch layer of sand and a mulch or straw so that the bulbs will not be frozen and will form a mass of roots in the pot. In late December, after the root system has been developed and the shoots are two to three inches long, the pots should be brought into a cold cellar or garage and from there carried a few at a time to the window to be forced into bloom. Most of the so-called “early” kinds will not bloom much before February.

After blooming has been completed the bulbs can be dried off and stored in a cool place during the summer if they are planted directly in the garden. These bulbs that have been forced will require a period of two years before they can be forced again.



Indoor Bulbs

There are two general types of indoor bulbs. The fall-planted type, like tulips and daffodils; flower in winter, and the winter-planted types; flower in spring and summer.

In this section, you will learn how to identify and grow bulbs and bulbous plants indoors and to show others how to grow them.

Materials for Planting Bulbs - Regardless of which bulbs you choose to grow, you will need certain materials:

- Pots for planting - approximately five to six inches in diameter, or bulb pots which resemble flower pots, but are broader and not as deep.
- Soil mixtures of garden soil, sand and organic matter.
- Gravel or small stones for drainage.

Fall - Planted Bulbs

Paper white narcissus, tulip, hyacinth, crocus and other bulbs can be forced into bloom in the house during winter.

Tender bulbs

Paper white and tender narcissus can be flowered in water. Other bulbs flower best in soil. Paper white or tender narcissus are easiest to bring into bloom. These can be in bloom for Thanksgiving or Christmas. They cannot stand frost, do not grow outdoors and are worthless after flowering.

Three varieties of tender narcissi are:

- Paper White - white
- Chinese Sacred Lily - white with a yellow center
- Grand Soleid'Or - yellow with orange-yellow cup

Buy large, plump bulbs from your seed store in October. Select a dish or shallow bowl large enough to hold three to five bulbs. Fill with pebbles, sand, gravel, pearl chips or similar material to within ½ inch of the top. Plant the bulbs so that the old roots on the bulbs are covered about ½ “. Add water until it comes up even with the top of the pebbles. Maintain this water level during the forcing period. Put the container immediately in a sunny window. They will flower in three to five weeks.



Hardy bulbs

Tulips, narcissus, hyacinths, crocuses and other hardy bulbs flower best in soil. Bulbs potted in September or October will flower in the house around January and February.

Varieties for forcing:

Tulips

White Hawk
Prince of Austria
White Sail
Weber
Kanas
Red Pitt
Wm. Copeland
Wm. Pitt
Utopia
Bartigon

Hyacinths

L'Innocence
Pink Pearl
Bismark
City of Harlem
Jan Oas
Lady Derby
La Victoire

Daffodils

King Alfred
Carlton
Early Perfection
Rembrandt
Golden Harvest
Spring Glory
Victoria

Potting

Pot the bulbs in special bulb pans measuring at least six inches wide or use regular flower pots four to six inches wide or any container having good drainage. First, place several pieces of broken pots, stones, or gravel in the bottom of the pot for drainage. If your garden soil is sandy, use it as it is. However, if your garden soil is heavy with clay, mix a sand with the garden soil. Fill the pot about one quarter full with soil and place as many bulbs as will fit in each pot, leaving ½” between each bulb. Don’t put different varieties or types of bulbs in the same pot. Be sure they are right side up. Cover them up with soil so that the top of the bulb is about ½” below the soil line. Leave ½” between the soil line and the rim of the pot for watering. Soak thoroughly with water immediately after flowering. Put a label in each pot with the name and variety of bulb.

Rooting

The best temperature for growing these bulbs is 4°C for rooting for 8+weeks, 10°C for growth of stems or leaves for three weeks, and 15°C for flower production. We cannot expect to have these exact conditions, but we come close. The bulbs must be well rooted before they are brought into the house. There are many different ways of storing the pots. Here are two easy methods.

- Building is often suitable. Dig a trench about one foot deep and fill in about three inches of drainage on the bottom. This drainage material may be sand, gravel, cinders or any other similar material. Put the pots as close as possible and then put a thick layer of peat moss on top of each pot. Then fill the soil back in. Put a few inches of straw on top after the ground freezes.
- Apple box or similar container - An easier method for 4-H members who have only a few pots of bulbs is to put them in an apple box or any similar wood container. Put in a couple of inches of drainage material in the bottom. Pack as many pots as possible in the box and surround each one with moist peat moss, leaves or similar material. The peat moss must be moist to the top. Place the box in a cool spot such as a cold storage unit where the temperature is about 4°C. Other locations where the box can be stored to force rooting are a garage, barn, etc. Be sure the bulbs do not freeze or get too warm. It may be necessary to cover the box with straw or shavings to prevent freezing if the temperature falls below 4°C.

Forcing Into Bloom

In five to eight weeks after planting, the bulbs should be well rooted and ready to force into bloom. Be sure that the bottom of the flower pot is a mass of roots. When the bulbs are first brought into the warmth, put them in as cool a place as you can find. A temperature of 4° C to 10° C is best. Perhaps you have a sun porch or other area which is cooler than the rest of the house. Keep the plants out of direct sunlight for about two weeks. After the bulbs have made a few inches of top growth, bring them into full sunlight where the temperature is 18° C to 22° C. Keep the soil moist at all times. An ample supply of water is especially necessary while the plant is blooming.

Winter-Planted Bulbs

These bulb-like plants started in January or February will flower in late spring and summer. Some of the common types are:

Amaryllis - Caladium - Gloxinia - Yellow Calla Lilies

Each of these plants require different growth conditions so they will be considered separately.

Amaryllis

1. Into a six-inch pot, put ½" of drainage material. Add a mixture of a sand, soil (garden loam), and peat moss or other organic matter.
2. Place the bulb above the soil surface.
3. Water well the first time, but give no more water until the bulb comes out of the bulb neck.
4. Water lightly until the bulb blooms
5. The flowers usually appear before the leaves grow.
6. After the bulb has flowered, plant it outdoors.
7. Dig up the bulb before frost in October, and store it in a cool, dark place in the cellar until the following January or until the buds show.
8. Bring it into a warm room where it will bloom.

Caladium

These plants are grown for their attractive colored leaves. The flowers are insignificant. There are many different varieties which have many colors and different sizes and shapes of leaves.

1. Start in March. Plant in a shallow pot or box.
2. Use a mixture of ½ sand and ½ leaf mold or peat moss.
3. Put the bulb in upside down with the roots on top. This will prevent rotting of the rowing tip. Cover about ½" deep. Keep the box or pot in a warm place (26° C to 30° C) if possible. A good location is next to a heater or a radiator.
4. As soon as the roots begin to grow, put them in 3" flower pots in a mixture of three parts leaf mold or peat moss; one-part garden loam and one-part sand.
5. As soon as the roots have filled the pots (plants are pot bound), replant in 5" or 6" pots. Use a soil mixture of two-parts garden loam, two-parts leaf mold or peat moss, and one-part sand.
6. Grow in filtered sunlight (shade from bright sunlight) and water freely. Do not transplant outdoors in the summer.
7. Feed with liquid house plant fertilizer every three weeks.
8. When the leaves begin to fade, gradually reduce water until they are completely dry.
9. Store in the dry soil in the pots or in peat moss under warm, dry conditions until the next season.

Gloxinia

Bulbs started in January will bloom in June.

1. Use a 5" pot with a mixture of peat moss or leaf mold and garden soil.
2. Plant the bulb about 1" below the surface.
3. Water thoroughly, but do not let the bulb become waterlogged.
4. Let it dry off a month after it has finished flowering and store the tuber in a cellar until next year.

Yellow Calla Lilies

Bulbs planted in January will bloom in March

1. Use bulbs 1½" in diameter or larger.
2. Fill a 5" pot with a mixture of leaf mold or peat moss and a garden soil.
3. Cover the bulb ½" and set it in a warm place (next to a radiator) and keep it well watered. Keep in bright light.
4. Plant outdoors to finish leaf growth after the frost is past.
5. Dig it up in September and store it in a cool, dry place until next January.

Section II

Activities

1. Do some research on the different types of house plants you have at home. Find out how much light and water each one needs and how often they should be repotted.
2. Plan a trip to a local florist or garden centre to find out what products are available for house plants, such as fertilizers, pest control, rooting compounds, etc. Which would be best for the plants you have at home?
3. Buy a few bulbs and plant them indoors in the fall or winter. Check the hints in this chapter to find out how to grow each type indoors.

Section III

Outdoor Flower Gardens

YOUR FLOWER GARDEN

The flower garden is a very interesting and rewarding place to work. If you plan it well, you will have continuous blooming from early in the spring until late in the fall. You will be working with annuals, perennials, biennials and flowers which grow from bulbs. This will open the door to a life long hobby.



PLANNING YOUR GARDEN

Remember, **PLAN** comes before **PLANT**. Make a plan on paper. A scale of 1 cm ($\frac{1}{2}$ inch) equals $\frac{1}{2}$ metre (18 inches) can be used. Include in the drawing any buildings, fences, and trees which are in the area and note the compass points.



Before sketching in the plans, list the plants that you will need. Learn as much as you can about each plant. Some things you need to know are the season of bloom, the color of the flowers, height and spread, habit of growth and the color and texture of the foliage.

General Rules:

There are several general rules which should be kept in mind: These rules apply to perennials, annuals, and biennials.

- Consider the sunny and shady areas. Remember, the summer sun is in the southern sky. Trees and buildings create shady areas. Try to keep your flower bed in the sun for three quarters of the day.
- What size should the flower bed be? Usually a border should be no wider than 1 meter (three feet) unless you can reach it from both sides. Don't do too large an area, it will be better for you to do a small area and to do that well.
- Consider the final height of the plants. Place the tallest to the back in a border which will be seen from one side mainly, and to the middle of the bed which will be viewed from all sides. You can plant a garden using various heights of just one flower like zinnias, snapdragons or marigolds. You will want to use fairly large groups of plants to prevent a spotty appearance. Usually three or more of the larger plants are used in a group, whereas five or more of the smaller ones are needed.
- Plan your garden so that some plants are in bloom from early spring to late fall. In large plants, flowers are sometimes grouped by seasons so that some areas are especially attractive at each blooming season.

- Consider the colors of the flowers. Not all colors look well together. Correct color combinations are important. Some combinations of closely related colors are not attractive. For example, scarlet and crimson clash, and magenta or purplish rose appear muddy where they are combined with salmon or clear pink. Try to use plants which you know have a certain color and then scatter them evenly along the bed. Some colors that look good together are:

Pink, yellow and blue	Pink, rose and crimson	Blue and yellow
Red, yellow and blue	Blue and orange	Yellow and orange
Red, pink and white	Blue and white	Yellow, bronze and orange
Violet and yellow		

- Plant low-growing perennials along the front for the flower border and taller varieties in the background. Groups containing three or more plants of each variety provide a mass of color rather than a spotty appearance.
- A fence, hedge or shrub border will make an excellent background. Be sure to leave enough room so you can walk between the border and the background. This will make it easy for you to cultivate the garden. Also, it will prevent vigorous roots of shrubs and hedges from penetrating the flower border. The border need not have a straight front if a curved area fits into the landscape better.

GROWING ANNUALS

Annual plants grow from seed, flower, produce seed and die all in one year. The annual flower bed will just grow for one year. Annual transplants can be obtained from your local greenhouse operator or you can start your own from seed in the early spring. You can sow your seed directly in the garden, however, if possible you should start your plants indoors. Try planting a border for your garden, a simple foundation planting, or a small flower bed.

There are many annuals which you can plant. Some of the more popular ones are:

Zinnias	Bachelor Buttons
Cosmos	Asters
Marigolds	Petunias

There is a list of annuals at the back of this unit.



Preparing to Plant the Annual Flower Bed:

Once your plan is finished you will know if any of your flowers have to be started indoors.

Annual flowers may tend to grow tall and skinny. You have to give them as much sun as possible and pinch the growing point to get them to bush out. "Pinch" means to remove by cutting off with one's thumb and forefinger.

Once the ground is dried out in the spring it should be well worked. To tell if the soil is dry enough, take a handful of it. If it forms a mud ball it is too wet, but if it crumbles, it is dry and ready to work. A garden spade can be used to dig the soil to a depth of 20 -30 cm (8 - 12 inches). Fertilizer may have to be added.

Planting:

Sow the seeds or transplants outside after the soil is warm. Where you are planting seed, plant three to four to insure a good stand. These will be thinned to one or two once they are up.

Keep your flower bed weeded and free of insect pests. Remove dead blossoms and foliage.

To get the most fun from your flower garden, keep records on when it was planted, when various varieties flowered, and of any problems you had and how you overcame them.

STARTING YOUR PLANTS INDOORS

Step one: Before trying to raise plants from seed, you need certain utensils. Make a list of everything you need and gather this together. You will need plastic or clay flower pots. Make sure that they have drainage holes. Do not grow seedlings in undrained ceramic containers. Other types of containers are shallow boxes called flats, which may be made of wood, plastic or fibre. Both pots and flats, if previously used, should be cleaned thoroughly in a weak javex solution and then rinsed. New clay pots should be soaked in water overnight.

Step two: Choose your soil medium. Your plants will need a growing mixture if they are to be sown indoors. A good mixture containing two parts of loam, one of peat moss and one of sand, provides good drainage and yet holds moisture. You could also purchase regular potting soil. This has been pre-sterilized and will serve the purpose.

Step three: Prepare your pots for planting. Place a few stones or pieces of clean broken pot in the bottom of each pot to provide drainage. Fill the pots up until you are 1 cm or a little more below the top.

A 9cm pot will normally hold sufficient seedlings of any one kind for most home gardens, but a 13cm pot may have to be used for large seeds such as those of zinnia.

Place the pots in a shallow tray of water and allow to stand until the mixture soaks to the top. Flats should be watered thoroughly with a fine spray from a can. Set them aside to drain and then they will be ready for seeding.

Step four: Scatter the seeds thinly over the surface or sow in rows. Press very fine seeds lightly over the surface; they need no other cover. Many tiny seeds require oxygen and/or light to germinate. The depth of the growing mixture needed to cover other seeds varies with the size of the seeds. Twice the diameter of the seed is considered the best depth. Label each pot or flat as it is sown to avoid any chance of error. (You could use a popsicle stick or stir stick for this.)

Please Note: Great care is needed in watering seeded pots and flats. Instead of watering the surface of the growing mixture, stand the pots and flats in shallow trays and let the water soak up from below. Place your pots in a warm location.

Growing Plants From Seeds or Sexual Propagation:

Seeds develop from the parts of a flower. When a seed is mature it is really in a resting stage (dormancy). Most of our outdoor flowers, vegetables and grains are grown from seed. It is quick and cheap to grow plants this way.

Soil Mixtures for Seeding:

Seeds that are beginning to germinate should have moisture, but also good drainage. They should have good aeration as well. These conditions are also necessary for root cuttings. A good mixture for growing seedlings is equal amounts of garden soil, peat moss and sand combined together. This mixture should be sterilized with steam and then sifted through a ¼ " sieve. This will help to get rid of weed seeds, organisms which produce disease and any large particles that might interfere with the growth of the seedlings.

Seed Size and Planting:

Seeds, like people, come in many different sizes, shapes and colors. The size of a seed helps the gardener know how deep to plant it. Petunia seeds are about the size of dust particles, and coconuts, which are also seeds, may weigh up to six kg (fifteen pounds). Tiny seeds are spread evenly on the surface of the soil and watered. A general rule is: Seeds should be planted no deeper than five times their diameter. Always use fresh seeds.

If seeds have been saved from the previous year, they should be tested. This can be done by placing about 20-25 seeds on a wet paper towel. Keep the paper towel moist and place it in a warm location. If the seeds are still good, at least one half of them should germinate in seven to ten days. If they do not, new seeds should be purchased.

Planting Seeds Indoors:

Use a small container, a 10-12 cm (4 or 5 inch) pot, depending on the amount of seeds you are going to plant. Fill it almost to the top and press the soil down lightly so that it is firm. Plant the seeds in little holes. Cover them over gently and water them a little. Keep the mixture moist (not mucky) until the seeds germinate. Most seeds will germinate easily at house temperature (between 17°C and 23°C).

Soil in clay pots dries more quickly than soil in other kinds of containers such as plastic. A plant has to be watered much less if it is in a plastic pot than if it is in a clay pot because water only escapes from the top and the bottom of a plastic pot. Clay pots have little holes all through them so the water can evaporate from the top, bottom and sides of the pot.

Transplanting:

For most plants, the first leaves which appear above the ground are the cotyledons. They are also called the seed leaves. These are not true leaves; they provide energy for the plant. It is not time to start transplanting, however, until the true leaves (the second set of leaves) of the plant appear above the ground. When the true leaves do appear, you can begin to transplant.

Steps in Transplanting:

1. Gently remove the small seedlings from the soil with a pencil or other tool.
2. Make a hole in your soil and carefully plant the seedlings about five cm (two inches) apart from each other. The soil should be lightly pressed around the stem.
3. The soil will be further settled by watering after the transplanting has been completed. The flats and pots of seedlings should not be set back into sunlight for twenty-four hours or severe wilting may occur.
4. When the plant has grown larger and it is time for the last transplant, the seedlings are lifted from the soil they are in. Usually a clump of soil will be attached to the roots. This soil should not be removed. Place the seedling with the ball of soil attached to it in its new pot. If the roots of the plant are going around in a circle, gently pull the roots apart so they can spread out. This will make a healthier plant.



PERENNIALS

What are perennials? Perennials are plants that, once established, will bloom each succeeding year. Compared to annuals, they have a short season of bloom. Although, if you use a good variety of them, you will have flowers from spring until fall, year after year.

Most perennials are bought as small plants, but they can be grown from seed. Small plants should be planted with their crown at the soil level and the soil packed firmly around the roots.

Perennials are herbaceous plants which grow for more than two years from the same root. Sometimes a few biennials may be included in the group. These plants grow from seed, bloom the second year, and die after they have produced seeds.

Some perennials last for many years. They should be divided and separated every couple of years so that overcrowding will be prevented.

Plants are obtained in three ways - from nurseries or garden centres, from seed, or by division of clumps of perennials. When you decide to plant your perennials, it may be better to go to a greenhouse for them. If you get them from a neighbour or friend, make sure they are disease free.



Location

Most perennials grow well in full sunlight, but there are some which when they are planted in full sunlight do not produce full, true roots. Most perennials need at least half a day of sunlight.

Perennial plants must be protected from the wind. Strong winds and rain can damage the blooms and snap the stems of a plant. Low growing plants are not usually harmed by wind but tall ones can be badly injured. A building or hedge can be used as a good windbreak for perennials

Soil Preparation

Perennials grow well on a well drained soil which has sufficient organic matter to retain some moisture. The soil should be broken up and decayed leaves and other organic matter should be mixed in with it. This improves the condition of the soil and adds some plant food to it. A complete fertilizer (6-12-12 or 5-10-10) should be worked into the soil at this time.

Planning the Perennial Border:

The blooming periods of some popular perennials are:

May: Early spring bulbs such as daffodils, tulips, snowdrops, crocuses

June: Bearded iris, peonies, lilies and evening primroses

July: Delphinium, lilies, early phlox and poppies

August: Later blooming phlox, michaelmas and daisies

September: (before frost) hardy chrysanthemums, and fall aster

Care of Perennials

As soon as the frost is out of the ground in the spring, the garden plot should be inspected. If any of the plants (roots and bulbs) have come out of the ground, put them back in. Plants that are usually strong and healthy can die very easily if the roots are exposed to air.

When it is time for the earth to be worked, a complete fertilizer should be added to the soil. Manure or compost can also be mixed in.

Blooms which are faded should be cut off before they produce seeds. This practice will also keep your garden neat. Withered and dead foliage should be removed also.

In the late fall when plants have stopped blooming and a lot of foliage has been killed by frost, the plants should be cut off to the ground. The border should be cleaned up by removing all seeds and scattered bits of material. After the ground has been frozen for the winter, evergreen boughs or other brush should be placed over the area where the plant roots. This provides cover which snow can fall on and prevents the land underneath it from thawing out during the winter.

If you cultivate your garden regularly during the summer, only small weeds will grow. It is easy to get rid of these. Weeds should never be allowed to grow to be mature and produce seeds because the result will be a fresh crop of weeds for the next season (the seeds will remain dormant all winter and then sprout into weeds the next summer).

Sometimes perennial plants which are tall must be held up by stakes. It is a good idea to try and hide the stakes because they can spoil the appearance of the flower garden.

Plants can be protected from low temperatures and mud spattering by using mulches (straw, chopped bark, paper, etc.) and ground cover plants. A mulch will help keep the soil from freezing and thawing. Ground cover plants such as thyme, portulaco and Japanese Spiviage will make sure the bulbs have a dry rest period. These plants use up most of the water.

Bulbs

Flowering bulbs are a sure sign of spring in almost all gardens.

A bulb is a modified stem. There are two types of bulbs - tunicate or layered bulbs such as tulips and onion, and non-tunicate or scaly bulbs such as lily.

The tunicate bulb is made up of continuous concentric layers covered by a dry papery outer layer. These bulbs become dormant after summer growth is finished and can be dug and stored or distributed at this time.

The non-tunicate bulb is made up of separate scales, and has no protective covering. Also, they do not become dormant after summer growth. For these reasons, non-tunicate bulbs are more easily damaged and they must be kept moist at all times. They should not be kept out of the ground for long.

Many bulbs form offsets; small bulbs attached to the mother bulb. These may require several years to grow into flowering sized bulbs.

Corms:

A corm is the swollen base of stem axis enclosed by dry scale-like leaves. The gladiolus and crocus both grow from corms. Each year a new corm forms above the old one. Miniature corms or cormels develop from the main corm. These require one or two years of growth before they reach flowering size. Large corms can be cut into sections retaining a bud with each section and each part developing into a corm.

Soil:

The soil requirements for bulbs are much the same as for other types of plants. A well drained, light textured, fertile, sandy loam is recommended. A rich, loamy soil will produce blooms of better color and substance than very light, sandy soils.

The pH of the soil should be 6 to 7 for the best results. This will let air and water enter the soil easily.

Sun and Shade:

Most spring bulbs like the full sun. They will, however, bloom if they are planted under trees because the leaves of the trees are not out at this time. They should not be planted under evergreens or on the north or northwest side of hedges or fences because they will not receive enough light. These plants will have weak leaves and the bulbs will rot.

Protection:

Bulbs must be protected from the following:

1. High winds
2. Mud splattering of low growing flowers
3. Low temperatures

Plants can be protected from low temperatures and mud splattering by using mulches (straw, paper, etc.) and ground cover plants. A mulch will help keep the soil from freezing and thawing. Ground cover plants such as thyme, portulaca and Japanese Spiviage will make sure the bulbs have a dry rest period. These plants use up most of the water.

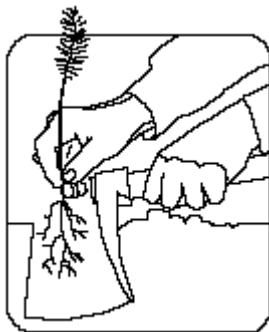
Planting Depth and Spacing:

Planting depth for bulbs varies with species and varieties. In general, for large bulbs, planting depth should be two to three times the diameter of the bulb being planted.. For smaller bulbs, the depth of the hole should be three to four times the diameter of the bulb being planted.

The distance apart for large bulbs should be one and a half to two times the depth of planting and two or three times the depth of planting for small bulbs. After the bulbs have been planted they should be watered heavily so that root growth will begin.

Bulbs can be left in place for several years providing there is rich soil underneath them. Dig, separate and plant them when they become crowded or produce small flowers.

Always remove seed pods of tulips as soon as the petals drop, also the stems if you wish. Do not remove the leaves, which are necessary for the proper ripening of the bulbs, until they die down naturally in mid-summer. If it is desired to use the tulip beds for annual planting, the tulips may be taken up carefully, leaves and all and heeled in to ripen in some obscure corner in the garden.



Selecting Your Bulbs

Before you choose the bulbs for your garden, you should decide which ones would fit into the space you've provided for them. You should find out how large the plant is and the size of its bloom. Good bulbs should have the following characteristics:

1. Firmness - The layers of tissue should be plump and fairly hard with no feeling of softness when pressed in the hand.
2. Weight - Good bulbs should be fairly heavy in weight and very firm.
3. Condition - The skin or coating on bulbs should be smooth and free from injury because badly skinned bulbs may have fungus disease.

This can be prevented by dusting with sulphur.

Preparing the Soil

It is a good idea to add a three inch layer of peat moss to the soil when it is first worked. A mulch of fresh manure should not be put over dormant bulbs, tubers, corms or lilies because they may get a fungus disease.

You can add lime to bring up the pH, if it is low, by adding limestone or wood ashes. A good application of bone meal would help at planting time to further root development.

Watering

Bulbs should be watered when they need it. As a general rule, bulbs need a lot of water from the time their flower buds begin to develop until their leaves mature and their flowers come into bloom.

Care of Foliage

When the petals of a flower begin to drop off, the flower should be removed from the plant. The foliage should not be cut off until it drops off naturally.



SOME COMMON ANNUALS THAT CAN BE SOWN DIRECTLY IN THE GARDEN

<u>COMMON NAME</u>	<u>BOTANICAL NAME</u>	<u>FLOWER COLOUR</u>	<u>HEIGHT</u>	<u>LOCATION</u>	<u>MOISTURE</u>
1. Annual Gaillardia, or Painted Gaillardia	Gaillardia Putschella var. Picta	Usually yellow with brownish or purplish red markings	12" - 24"	full sun	Drought tolerant
2. Baby Blue-Eyes	Nemophila Menziesii	Blue with white centres	3" - 12"	best in partial shade	Not drought tolerant
3. Butterfly Flower	Schizanthus Species	Variously coloured	24" - 60"	full sun	Not drought tolerant
4. Calendula, Pot Marigold	Calendula Officinalis	Shades of orange or yellow	12" - 24"	full sun	Drought tolerant
5. California Poppy	Eschscholtzia Californica	Yellow to orange	12" - 24"	full sun	Drought tolerant
6. Capemargaritold or African Daisy	Dimorphotheca aurantiaca	Shades of cream, lemon or orange	12" - 30"	full sun	Drought tolerant
7. Common Gypsophila, or Annual Baby's Breath	Gypsophila Elegans	White or purplish	18"	full sun	Not drought tolerant
8. Cornflower or Bachelors' Button	Centaurea Cyanus	Blue, pink or white	12" - 36"	full sun	Drought tolerant
9. Cosmos	Cosmos Species	Pink, blue, crimson or white	36" - 60"	full sun	Not drought tolerant
10. Garden Balsam	Impatiens Balsamina	Various colours, white, red, yellow	30"	tolerate light shade	Not drought tolerant
11. Nasturtium	Tropaeolum Majus	Variously coloured	10"	full sun	Not drought tolerant
12. Plains Coreopsis	Coreopsis Tinctoria	Yellow with spots of brown	8" - 15"	partial sun	Not drought tolerant
13. Prince's-Feather	Amaranthus Hybridus var. Hypochondriacs	Red flowers, red foliage	24" - 36"	full sun	Not drought tolerant
14. Rocket Larkspur	Delphinium Ajacis	Violet, rose, pink, blue or white	12" - 24"	full sun	Not drought tolerant
15. Rose-Moss or Garden Portulaca	Portulaca Grandiflora	White, pink, red, yellow or purple	4"	full sun	Drought tolerant
16. Scarlet Flowering Flax	Linum Grandiflorum	Red or pink	12"	full sun	Not drought tolerant
17. Straw Flower	Helichrysum Bracteatum	Yellow, orange, red or white	18" - 36"	full sun	Drought tolerant
18. Sweet Pea	Lathyrus Odoratus	Various colours, white, blue, pink	climber	full sun	Not drought tolerant
19. Sweet Scabious	Scabiosa Atropurpurea	Dark blue, rose or white	24"	tolerate partial shade	Not drought tolerant
20. Virginian Stock	Malcomia Maritima	Lilac, red or white	6" - 12"	tolerate partial shade	Not drought tolerant
21. Zinnia	Zinnia Elegans	Various colours	6" - 4'	tolerate partial shade	Drought tolerant

GOOD PERENNIALS FOR YOUR GARDEN (FOR SPRING BLOOM TO MID-JUNE)

LESS THAN 1 FOOT TALL		
COMMON NAME	COLOUR	REMARKS
Goldentuft Alyssum Lily-of-the-Valley Evergreen Candytuft	Yellow White Coral Red	Mass of Yellow Flowers Excellent for Shade Propagate by Division
1 TO 3 FEET TALL		
Columbine Common Bleedingheart Siberian Iris Peony Oriental Poppy	Red, Yellow, Blue Pink Various White, Pink, Red Orange, Pink	Long spurred types are excellent Likes part shade Divide in July and August Divide in September
(FOR SUMMER BLOOM June - September 1 TO 3 FEET TALL		
Painted Lady (Pyrethrum) Shasta Daisy Coreopsis Pinks Gaillardia Geum Daylily Planain Lily Perennial Flax Phlox	Various White Yellow Pink and White Crimson Orange Orange, Yellow, Scarlet Yellow, Red, Orange Blue, White Blue, White White, Pink, Red	Good cut flower Cut flower Long bloom, cut flower Needs full sunlight Full sunlight Needs good soil Good summer flower Good in shade, large foliage Evergreen Divide in Fall
OVER 3 FEET TALL		
Monkshood Delphinium Tall Gayfeather Purple Loosestrife	Blue Blue, white Rosy Purple White	Needs staking, prefers shade Needs staking and good drainage Needs moisture Good in moist soil
(FOR FALL BLOOM - SEPTEMBER TO OCTOBER		
Wood Anemone New England Aster Hardy Chrysanthemum	White, Pink Pink, Blue Various	Protect from wind, good soil Good fall flower Best in sunlight, use hardy types

FLOWER GARDEN CHECKLIST

NAME	DESCRIPTION	SOIL AND LIGHT	PLANTING	COMMENTS
ALYSSUM, SWEET <i>Lobularia Maritima</i> Annual	Two to six inch tall compact plants with fragrant, small petaled blossoms. White rose, and blue. Varieties: Rosie O'Day, Royal Carpet, Carpet of Snow, Sweet.	Full sun or partial shade. Tolerant of all soil conditions	Sow seed out doors in early spring, or buy transplants. Often will self-sow.	Use for edgings, borders, rock gardens, hanging baskets, and window boxes. In warm climates, will bloom all year. Trim to encourage new growth.
ASTER, HARDY Michaelmas daisy <i>Aster sp.</i> Perennial	Blooms from late summer to fall on 48 inch-tall plants. Varieties: A. novae-angliae "Harrington's Pink" and A. Novi-belgi "Sailor Boy" (violet). Dwarf varieties: Persian Rose, Melba (Pink), Blue Bouquet, Snow Cushion (white), and Beechwood Challenger (red).	Performs best in full sun. Thrives in almost any soil type.	Best to buy transplants.	Taller varieties may need staking in windy areas. Divide plants in the early spring every three or four years, being sure to remove the woody portions of the plant. To encourage bushiness, pinch back tall varieties in mid-June.
ASTILBE false spirea <i>Astilbe x arendsi</i> Perennial	Large, feathery flower heads and finely cut foliage throughout summer. Grows 15 to 30 inches tall. White pink, red, and salmon.	Prefers shade. Does well in almost any soil.	Start in early spring from transplants or by division.	Demands little attention. For best growth, keep plants well watered and fed. A 2 to 3 inch layer of mulch around the base of the plant will keep roots cool and moist.
BABY'S BREATH <i>Gypsophila paniculata</i> Perennial	Airy sprays of double white or pink flowers bloom in June and July. Bushy plants grow to 4 feet tall.	Performs best in full sun, in alkaline soil.	Sow seeds outdoors in the early spring where they are to remain.	Seedlings are nearly impossible to transplant once they have started growing. Divide established clumps every few years, and start new plants from root cuttings.
BEGONIA <i>Begonia</i> Annual	Ever blooming single and double varieties on shrubby plants 6 to 8 inches tall. White, pink, and red.	Grows in sun or shade. Will bloom best in shady areas, in loose, rich soil.	Start indoors 4 to 6 months early, or purchase plants.	Mass plants alone for best effect. Use as a pot plant year round. Take new cuttings from houseplants in early spring for your own bedding supply.
BLEEDING HEART <i>Dicentra spectabilis</i> Perennial	Pink, heart-shaped flowers and finely cut foliage on 24 inch tall stems. Blooms in early spring.	Partial shade. Needs moist soil.	Buy plants and space them 24 inches apart.	In mid to late summer, plants will die back to the ground, leaving space for annual flowers. Established plants should not be disturbed.

BROWALLIA amethyst <i>Browallia sp.</i> Annual	Petunia-like blossoms. Size varies. Heavily borne on dense plants. Blue, white, and violet. Varieties: Blue Bells Improved, Silver Bells, Velvet Blue.	Full sun or partial shade. Tolerant of all soil types kept moist.	Sow indoors 4 to 6 weeks early, or purchase plants.	At end of season, cut back plants and put in pots on a sunny windowsill for winter blooms.
CHRYSANTHEMUM <i>Chrysanthemum</i> Perennial	Bloom in late summer and fall on 1 to 3 foot-tall, bushy plants. Types cushion, decorative, quill, pompon, button, and spoon	Well-drained soil. Full sun.	Start in spring from cuttings or buy nursery plants in late summer.	In cold climates, select varieties that will bloom before the first expected killing frost. Cut back plants to 6 inches tall after they finish blooming.
COLUMBINE <i>Aquilegia sp.</i> Perennial	Arching sprays of red, white, blue, pink, or yellow crown-shaped flowers. Blooms in June on 20 to 30 inch stems.	Full to partial sun. Moist but well-drained soil.	Sow seeds in early summer.	To ensure perennial quality cut all spent blooms before they go to seed. Cut foliage back to about 4 inches when flowering period ends.
DAHLIA <i>Dahlia</i> Annual	Available in both dwarf and standard sizes. Flower types vary: formal, decorative, cactus, ball, and pompon are a few favorites. Blooms range from 1 to 12 inches in diameter on plants 6 inches to 10 feet tall.	Full sun. Rich, well-drained soil kept moist.	Sow outdoors 6 to 8 weeks early. Plant outside after frost danger is past.	Taller varieties need staking. When frost blackens foliage, dig up tubers and hose off soil. Store still-wet tubers in dry vermiculite, in a cool dry, dark location.
DAYLILY <i>emerocallis sp.</i> Perennial	Individual flowers last only a day, but each plant blooms for two weeks or more. Early, mid, and late season varieties available. Plants range in height from 18 inches to 5 feet.	Will grow in full sun or filtered shade, in almost all soil types.	Plant root divisions in the fall.	Divide plants every four or five years; do the job any time after flowering and before frost.
DELPHINIUM <i>Delphinium sp.</i> Perennial	Yellow, white, blue, pink, or lavender flowers on 1 to 8 foot stalks in June. Will bloom again in autumn if blooms are clipped off as soon as they fade.	Full sun. Do best in alkaline soil kept moist.	Plant nursery stock in the spring or sow seeds in early spring indoors.	Most varieties need staking. Plants are heavy feeders, so add manure or compost to soil every year, in late fall or early spring.
GERANIUM Annual	Versatile group with both single and double flowering varieties. Range from 4 inches to 5 feet tall. Scented with leaves smelling like mint, nuts, rose, and fruit. Some varieties are vines with ivy-shaped foliage.	Full sun, but can take some shade. Prefer well-drained soil.	Sow seeds indoors 10 to 12 weeks early, or buy plants.	Use all varieties as bedding, as well as pot plants. Over winter cuttings on a sunny windowsill. Treat as a perennial in warm areas.

IMPATIENS garden balsam <i>Impatiens sp.</i> Annual	One to 1½ inch, cup-shaped flowers on small, mounded plants 6 to 8 inches in diameter. Grow 8 inches to 3 feet tall.	Sun. Shade in warmer areas. Well-drained, light soil.	Sow seeds in early spring. In warm areas, sow in the fall.	Use shorter varieties as a ground cover, bedding, or edging plant.
IRIS <i>Iris sp.</i> Perennial	Seven major classes: bulbous, tall bearded, dwarf bearded, Dutch, spuria, Japanese, and siberian. All come in an array of colours and sizes. Early, mid and late blooming varieties available.	Full sun. Soil varies with the type.	Buy rhizomes and plant in the spring or fall.	Clumps of bearded iris need to be divided about every three years. When dividing, check for borers: cut them out.
MARIGOLD <i>Tagetes</i> Annual	Double, 3 to 5 inch blossoms on plants 2 to 3 feet tall. Foliage is finely cut. Dwarf varieties have single or double blossoms, 1 to 2 inches across. Cream, yellow, and reds.	Full sun. Almost any rich, well-drained soil.	Sow seeds indoors 6 to 8 weeks early or outdoors after frost danger, or buy transplants.	Use dwarf varieties in borders, edges, or tubs. Mix tall varieties with other flowers or plant in mass.
PANSY <i>Viola sp.</i> Annual	One-and-a-half to 3 inch overlapping flowers on low, spreading plants, 8 inches tall. Wide range of colours. Noted for the dark, central, facelike markings on the petals.	Full sun. Partial shade in warmer areas. Fertile, moist soil with good drainage.	Sow indoors 10 to 12 weeks early to get blooms in late spring or buy transplants.	Use as edging plants or in bulb and rock gardens. Keep cutting the flowers to stimulate growth. Pinch back young plants to encourage branching.
PEONY <i>Paeonia sp.</i> Perennial	Stunning 6 to 8 inch-wide single, semidouble, or double blossoms borne on 18 to 30 inch stems in spring and early summer. Attractive green foliage.	Full sun. Well drained soil.	Plant root divisions in September	Plants are pest and drought resistant. May be left undisturbed indefinitely. For more plants, lift and divide every 6 to 10 years.
PHLOX <i>Phlox sp.</i> Perennial	Long-lasting, clustered blossoms from midsummer to frost. Range in height from 6 inch dwarfs to 4 foot standards. White, pinks, reds, lavenders, and purples. Many hybrids have "eyes" of contrasting colour.	Full sun. Rich, moist soil.	Plant nursery transplants or root divisions in early spring.	Keep plants thinned out so that each supports no more than four or five stalks. Clip off bloom heads before they go to seed. Divide roots about every three years.
POPPY, ORIENTAL <i>Papaver orientale</i> Perennial	Available in both single and double blossom forms, in shades of orange and red. Bloom on 10 inch to 3 foot stems in early summer.	Full sun. Do best in rich, well-drained soil.	Plant nursery-grown roots in August, when plants are dormant.	Poppies don't like to be moved, so plant them where they are to bloom. Mulch with straw for winter protection.

<p>SALVIA scarlet sage <i>Salvia sp.</i> Annual</p>	<p>One to 2 inch, tubular flowers clustered on spikes. Plants 14 to 20 inches tall; dwarf varieties 12 inches tall. Deep scarlet, pink, blue, white.</p>	<p>Full sun or partial shade. Fertile, well-drained soil.</p>	<p>Start 6 to 10 weeks early indoors, or buy transplants.</p>	<p>Use plants in beds, borders, and patio tubs. Bright colours can be almost overpowering.</p>
<p>SNAPDRAGON <i>Antirrhinum</i> Annual</p>	<p>One to 3 inch, tubular flowers heavily clustered on spikes. Plants 6 inches to 3 feet tall. Mixed colours. An open-faced variety is available.</p>	<p>Full sun. Rich, well-drained soil.</p>	<p>Sow seeds 6 to 8 weeks early indoors, or buy transplants.</p>	<p>Use dwarf varieties in rock gardens or borders. Try tall varieties in back of borders. Pinching will stimulate growth.</p>
<p>ZINNIA <i>Zinnia</i> Annual</p>	<p>Blossoms 4 to 7 inches across on plants 2 to 3 feet tall; rounded, pointed, or cactus-type petals. Round blossoms 1 to 2 inches across on plants 6 to 12 inches tall. Mixed colours and bicolors.</p>	<p>Full sun. Tolerant of all soil types.</p>	<p>Start seeds 6 to 8 weeks early indoors or outside after frost danger.</p>	<p>Use dwarf varieties in borders, rock gardens, or window boxes. Try tall varieties in mixed beds or planted alone.</p>

TALL PERENNIALS

Hollyhock	Aster (tall)
Hibiscus	Lilium Henryi
Lilium Aurelianense Hybrids	
Lythrum	
Delphinium Termospis	
Rudbeckia Lanciniata	Heliopsis

PERENNIALS OF MEDIUM HEIGHT

Columbine	Aster (medium)
Chrysanthemum	Shasta Daisies
Bleeding Heart	Bysophila
Daylily	Iris
Lily	Lupins
Oriental Poppies	Peonies
Phlox	Pyrethrum
Rudbeckia	

DWARF PERENNIALS

Alyssum Saxatile	Iberis (Candytuft)
Arabis (Rock Cress)	Phlox Subulata
Campanula (Bell Flower)	Primula (Primrose)
Chrysanthemums	Viola (Violet)
Dianthus (Carnation)	Sedum (Stonecrop)
Geum (Avens)	Silver Mound
	Thymus (Thyme)

PERENNIALS FOR PARTIAL SHADE

Astilbe (Goatsbeard)	Lobelia
Lily of the Valley	Lythrum
Plantain Lily	Primula
Viola	

PERENNIALS FOR SUNNY, DRY LOCATIONS

Alyssum	Phlox
Aquilegia (Columbine)	Primula
Dicentra (Bleeding Heart)	Pyrethrum
Geum	Viola
Hemerocallis (Daylily)	Lupins
Trollius	Peonies
Iris	
Oriental Poppies	

EARLY FLOWERING PERENNIALS

Alyssum	Geum
Aquilegia (Columbine)	Trollius
Dicentra (Bleeding Heart)	Iris
Hemerocallis (Daylily)	Oriental Poppies
Viola	Phlox
Lupins	Pyrethrum
Peonies	Primula

MIDSUMMER BLOOMING PERENNIALS

Hollyhock	Astilbe
Campanula	Thermopsis
Chrysanthemum (maximum)	
Shasta Daisy	Delphinium
Coreopsis (Tickseed)	Dianthus (pink)
Gypsophila	Heliopsis
Hemerocallis	Lilies
Lythrum	Phlox

LATE SUMMER AND FALL BLOOMING PERENNIALS

Aster	Hibiscus
Chrysanthemum	Rudbeckia
Clematis	Sedum
Helianthus	

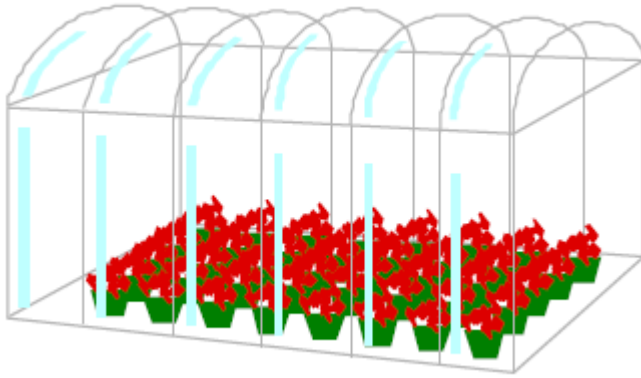
Section III

Activities

1. ACHIEVMENT DAY REQUIREMENT: Prepare a plan for your flower garden. Be sure to consider sunny and shady areas, existing buildings, trees, etc, and the size, height and color of the flowers you've decided to plant.

Section IV

Flower Arrangements



INTRODUCTION

In this area, cut flowers are produced by florists in greenhouses and in home gardens during the warmer summer months. The most popular varieties are roses, carnations, snapdragons and chrysanthemums.

If a plant is being grown in a greenhouse, it is left in a bed of soil until after it has produced flowers. It is then removed and destroyed. This process is usually repeated over and over. The length of time that a plant is in the greenhouse depends on the variety of the plant. It can range from ten weeks for chrysanthemums to several years in the case of roses.

Keeping cut flowers fresh for several days is not an easy task. If the flowers have come from a florist, they are likely cured. Curing is done by first cutting all stems off with a sharp knife, then placing the flowers in a cool basement for several hours before bringing them into a home. If flowers appear wilted, they may be revived by placing the stems in boiling water for five minutes, and immediately placing them in cold water. If you have flower preservative material (from a florist) this should be placed in the water that the flowers will remain in permanently. New water should be added to this periodically.

If the water contains no preservative material, it should be changed every day, and a small piece cut off the ends of all of the stems so that algae growth will be reduced. The location of cut flowers in a home is very important. If they are placed in a suitable location, their lifespan will be increased. Since they should be kept cool, flowers placed closest to the floor will survive longest. Cut flowers should never be placed near an open window, sunny window or near any electrical appliance, since these things will give off additional heat. The cooler the flowers are kept, the longer they will last. It is also important to keep them at the same temperature at all times.

Certain flowers wilt when they are placed near fruits or vegetables because of the ethylene gas which is given off by fruits and vegetables. Carnations and snapdragons may die from these gas fumes. By following these suggestions, flowers such as roses should last a week, carnations and snapdragons for two weeks and chrysanthemums for a month.

Flower Arranging

As long as man has recorded history on the face of this earth, he has made reference to flowers.

We find flowers carved on the stone walls of caves that were first populated by prehistoric man. In the ancient tombs of Egypt we still find well-preserved, dried flowers and flower seed pods.

Man has always associated flowers with his festival and morning celebrations, and even today in our modern society, flowers still hold a very important place.



Before you can start to arrange flowers you must have a good supply of fresh well-cured flowers. First, pick your flowers from your garden early in the morning when they are firm and full of moisture, and then soak them immediately in a pail of tepid water for several hours to help them survive the shock of cutting. They can also be cut in the evening and soaked overnight in a cool place that is free of drafts. Don't crowd flowers against each other at any time. Also, cut some buds or partially opened flowers so that you will be able to enjoy them for a longer period of time. Strip off all unnecessary foliage so that the stem does not have to feed more foliage than necessary.

Use only a very sharp knife or garden shears to cut the flowers, cut the stems on a slant to provide the longest area for the intake of water. Treat florist flowers on arrival the same way as garden flowers. Cut stems on a slant, put in tepid water for several hours in a cool place before you give individual treatment to each stem.

STEM TREATMENT

Soft Stems - Most annuals fall into this class and need to have a short centre cut at the base of the stem. Bulbous stems, such as narcissus stems, need to have the juice pressed from the bottom of the stem to help prevent clogging of the stem.



Woody Stems - Perennials and shrubs such as chrysanthemums, lilacs, fruit blossoms, forsythias, stocks, hydrangeas, etc. Bruise the coarse, outer stem with a hammer or a mallet to allow for a better water intake. However, roses respond better if about two inches of the outer skin is removed from the stem. If limp, they may require a centre cut to expose as many cells as possible for water uptake.

Hollow Stems - Delphiniums, dahlias, hollyhocks, poppies, etc. Dip the tip of the stem into boiling water for a minute, protecting the flowers from the steam with some newspaper, then put them in a pail of cool water for several hours. Use this shock treatment for limp flowers and ones that have been out of water for several hours.

Equipment

You will need a sharp knife or garden shears, several pails, various sizes of pin holders and containers and also some modern fillers, such as shredded Styrofoam, oasis or hydrofoam. All this material is available from your local florist.



Remember that the container is not that important in flower arranging. An arrangement can be made in any type of container. The flowers are the most important element in a flower arrangement and the container is secondary to the flowers. A lot of lovely containers and vases that are meant for flowers, should never be used for this purpose. These beautiful ornate containers take some of the natural beauty away from the flowers. Beautiful arrangements can be made in very inexpensive and simple containers.

Fill all shallow dishes and open containers with a sharp, deep pinholder or an oasis block. If you like certain colors and flowers, your containers should be collected to make them look nicer in every possible way - in color, texture, size, form and material.

Also, remember that flowers last longer if they are in clean containers. Dirty dishes hold bacteria which cause the flowers to die very fast.

There are almost no rules that have to be followed by flower arrangers. There are some principles of good design that you want to be aware of as aids to your own sense of taste and to add to your self-confidence. Once you are aware of them you will feel more free to follow your own sense of taste as you create designs with flowers.

Proportion

For the most pleasing effect the arrangement and the container should be proportional. Your flower arrangement is in the right proportion when it seems the right size for the container. The general rule is to have the height of the vase. Standard height rules for arrangements in low containers is that tallest stem equal 1½ to 2 times length or diameter of the bowl.

Balance

We say that flower arrangements are well balanced when they give a sense of stability - do not appear to be lopsided.

The two kinds of balance are: symmetrical (two halves are identical or nearly identical) and the asymmetrical (two halves are not actually equal but appear to our eyes to have equal weight or importance).

Symmetrical balance is relatively easy to secure. Asymmetrical balance requires greater practice, but can be more rewarding and challenging to our skill.

COLOR CONTRAST

Color contrast in a flower arrangement is obtained by combining flowers that have dark shades with flowers which have lighter hues. Pale hues have less value than deep shades. Dark colours will look best low in an arrangement, as they appear heavier to the eye. You should consider the flower color schemes of the rooms into which the flowers are going to be placed. Yellow, a warm color - is a good choice for flowers to dress up a blue room. White is a combination of all colors, so it's always safe to use white flowers in any room, no matter what its color scheme. White will not lend warmth to a room.

The violet hues will always be right in a blue room because they are neighbours of blue on the color wheel. Take a lesson from nature and don't be afraid to put green in the picture, no matter what the color scheme. In rooms decorated with definite complementary color harmonies, the best choice of flower colors is usually the tints and shades of the two colors already used.

CONTRASTING TEXTURES

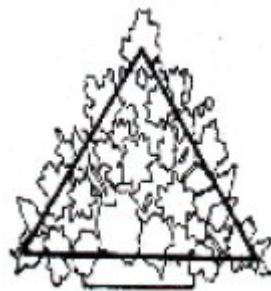
Contrasting textures in an arrangement are easy to create. You can combine soft, velvety flower petals with shiny, glossy foliage or coarse, ruffled petals with sleek leaves.

HARMONY OR UNITY

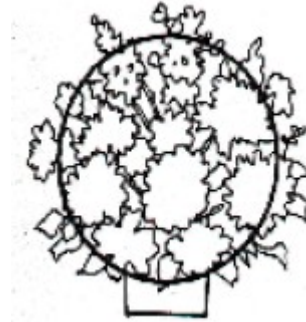
This is always our final goal in arranging flowers. It is the result of making a skilful selection of plant materials, container, accessories, and setting so they all seem to belong together. If all three elements are effectively blended, the outcome will be satisfying in design and a harmonious whole.

THE BASIC SHAPES

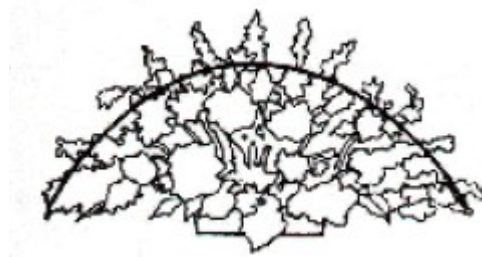
The Triangle - is a popular basic shape for symmetrical arrangements. The first step is to establish the height and width of the foliage and flowers. Fill in the centre with larger blooms. The Triangle is a very important shape for modern arrangements because of the attractive asymmetry they make possible. Triangle arrangements are usually most effective in shallow rectangle containers.



The Circular - form is the one that nature uses the most. Arranging flowers in circular design adds a pleasing element of repetition.



The Crescent - shape is asymmetrical. It is a sophisticated design.



The Hogarth or “S”

Curve - is a favourite one for

flower show entries.

Use Torch arrangements to get height. Glads, using their own foliage are excellent for this type of arrangement, but many tall plant materials are equally adaptable.

The Convex Curve is very important for dining room table arrangements. It does not need to be tall to be effective, and when it is kept low, it won't interfere with across-the-table talk or view.

In constructing an arrangement with a variety of material, it is important for the beginner to keep the largest and most important or most colorful material for the centre. The focal point, or the centre of interest, is the place where the lines appear to meet and where good color and form attract the eye first.

The habit of using all the flowers that you happen to have available is a bad one. This can cause the whole arrangement to be spoiled.

Like painting, interior decorating or any other art or craft, arranging flowers tastefully comes with practice. But the principles can be quickly grouped.

The following are some Do's and Don'ts of flower arranging.

DO



- Do select a flower holder or container filler; remember, flowers cannot be arranged in water alone.
- Do use flowers that have been cured.
- Do begin your arrangement with a skeleton outline and build it toward the centre or focal point.
- Do make your longest stem about 1½ times the height or width of your container.
- Do make every flower count to its fullest advantage.
- Do use smaller, lighter flowers on the outside and larger, darker ones towards the centre front.
- Do combine your flower shapes with consideration - spikes to give height, round flowers to create focal points, and flower clusters to fill empty spaces.
- Do keep your best material for your focal points.
- Do use interesting foliage for good line separation.
- Do trim your material to give a better line and a better look.
- Do use the right container.
- Do cut your oasis ½" or 1 cm higher than your container.

DON'T



- Don't use flowers of all the same height.
- Don't stick to any general rules; use your imagination.
- Don't cut a stem until you are sure that it must be shorter.
- Don't spread your stem out at the base; all lines should appear to come from the same point.
- Don't ignore texture; containers and flowers should be related - sweet peas in delicate glass, zinnias in earthenware.
- Don't use equal amounts of different flowers; when combining them, allow one type to be predominate.
- Don't spoil your colors by mixing them in a salt-and-pepper fashion. Allow one color to be predominate.
- Don't place the darker flowers high in arrangements unless the quality of lighter flowers creates a balance.
- Don't allow the oasis to show.
- Don't keep adding bits and pieces that are lying around; leave your arrangement alone when you are first satisfied.
- Don't put flowers near heat, in direct sun or drafty places.
- Don't forget to keep your containers filled with water.
- Don't use clear glass containers - it is hard to hide the oasis and stems.

GARDEN CUT FLOWERS FOR FLORAL ARRANGING

ANNUAL

Zinnia
Sweet Pea
Stocks
Snapdragon
Calendula
Cosmos
Larkspur
Aster
Salpiglossis

PERENNIAL

Coreopsis
Rudbeckia
Delphinium
Gypsophila
Columbine
Russell Lupines
Pyrethrum
Shasta Daisy
Day Lilies

BULBS & ROOTS

Tulip
Daffodil
Dahlia
Iris

DRIED FLOWERS

Statice
Helichrysum
Larkspur
Ornamental Grass



Other Projects

MAKING CORSAGES

Materials:

You will need ... flowers, wire, foliage and tape. You may also need ribbon. A wire cutter and scissors are also needed.

Wire:

Wire is sold according to size. The larger the number of the wire, the finer it is. For corsage making, three good sizes of wire are:

Size 32 - a fine wire for small or fragile flowers. Florets of gladiolus and delphinium need this fine wire.

Size 28 - a medium wire for most of the daisy-type flowers.

Size 22 - a heavy wire used with heavy flowers such as roses, iris and peonies.

If this wire is not available from your florist, you may find spools or windings of it at craft stores, the dollar store, or at hardware stores.

Foliage:

Stiff green foliage, useful as a backing for your corsages can come from Rhododendron, English Ivy, Mountain Laurel, Honeysuckle, Juniper, Holly or Dwarf Burning Bush.

Tape:

Floral tape to cover the wired stems is very handy. Some commercial florists may sell you this tape. You can use colored cellophane tape if you like.

Ribbon:

A bow or ribbon often helps to finish off a corsage. A bow is made from a piece of $\frac{3}{4}$ or $\frac{1}{2}$ inch wide ribbon of a color appropriate for the flowers used.

Flowers:

Because a corsage is made from fresh flowers, use only flowers that last three hours or longer. Some flowers wilt quickly out of water and cannot be used in a corsage. The following flowers can be used:

Snowdrops	Primrose	Peonies	Grape Hyacinths
Marigold	Gladiolus	English Daisy	Geraniums
Tulips	Iris	Delphinium	Pinks
Lemon Lilies	Roses	Sweet Peas	Asters
Chrysanthemums	Narcissus	Lily of the Valley	Shasta Daisy
Dwarf Iris	Carnations	Gaillardia	Zinnias

Wiring Flowers:

Flowers with hollow stems can be made strong to a fixed position in a corsage by pushing a size 22 wire up through the stem and into the flower. Daffodils and zinnias are treated this way.

Many times, large stems are replaced by wire. When wiring roses, use size 22 wire. Cut the stem down to two inches. Run a wire through the hard green part under the petals. Bend the wire down on both sides of the green part and twist one of the wires around the other wire and the short stem.

Carnations can be wired this way too, using size 28 wire. Carnations can be made larger and more fluffy by removing the green casing (calyx).

Flowers with thin, stiff stems can be wired by running a size 28 wire along the stem. Push the wire through the flower making a small hook. Then, pull the hook into the petals and wind the wire around the stem. Small flowered chrysanthemums are sometimes wired this way.

To wire a gladiolus floret, wrap the base of the floret with colored tape to prevent crushing the floret. Gladiolus can be built into a "glamellia" by opening the floret and removing the stamens and pistil. Add a bud for the centre. For a stiffer centre, run a size 28 wire up into the base of the bud. Wrap the opened floret around the bud. Build up the wanted size by adding more opened flowers. Run three or four fine wires through the assembled "glamellia". Bend these back and wrap them around each other lightly. Wrap with tape.

Wiring Foliage:

Make a hairpin of size 28 wire. Push it through the leaf one inch above the lower edge. Extend one of the ends of the wire along the stem. Wind the other wire around the stem and wire.

Making A Bow:

You will need several feet of ribbon for a bow. Holding a piece of ribbon between your thumb and index finger, make several loops above and below your fingers. Pinch each loop between your fingers as it is made. Place the centre of a one-foot piece of size 28 wire on the spot where you pinch the loops. Pull the wire around the ribbon and twist it together tightly at this point two or three times. Use the free ends to fasten the bow to the corsage.

Types of Corsages

There are three types of corsages:

- 1) Cluster
- 2) Spray
- 3) Individual Flower

Cluster or Nosegay:

A cluster or nosegay corsage is made up of flowers grouped in a mass. A colonial bouquet is assembled by starting with one flower in the centre, such as a rose. Other flowers are worked around the centre in a circle until the size wanted is reached.

The other type of cluster corsage is made by gathering one type of flower into a ball-like mass. This is often done with sweet peas or violets. The sweet pea or violet corsage does not require separate wiring of individual flowers as the flowers are tightly packed and support each other. A backing of stiff, green leaves adds more support. A wrapping of aluminum foil creates a good finish for a cluster corsage.

Spray:

Spray corsages are individual flowers arranged in a loose group. Wired stems are needed as the wire holds the flower in the position you place it. Roses, daisies, iris, chrysanthemums and most round corsage flowers can be treated this way. After arranging the flowers the way you want them, add wired foliage to form a backing. Secure the whole corsage with a piece of wire by wrapping it tightly around the other wires; binding them together.

Individual Flowers:

The individual flower corsage is usually made of one large flower such as a peony, tulip, iris, lily, etc. A wired flower and flower bud are generally used, backed by two or three leaves. The leaves accent the beauty of the bloom.

WINTER BOUQUETS

Winter bouquets are arranged or composed of dried flowers, weeds, grasses and other plant material. Driftwood, stones and artificial material such as figurines and small animals are often used in winter bouquets. Many trees, shrubs and wild plants provide excellent material.

DRYING FLOWERS

Fall is a good time to begin drying flowers, seedpod and ornamental grasses for later use in indoor arrangements.

Steps to follow:

1. Gather the flowers at midday when the humidity is lowest. Pick some buds as well as flowers almost at peak bloom. Avoid fully opened flowers as they do not last long when dried.
2. Strip the leaves from the flower stems, tie the stems in small bunches and hang them upside down in a dark, dry place with some circulation of air. Flowers will be dry in three weeks if conditions are right.

Good choices for drying include artemisia, baby's-breath, Bells of Ireland, Celosia, Chinese Lantern, Delphinium, Globe Amaranth, Globe Thistle, Heather, Hydrangea, Larkspur, Lunaria, Blue Salvia, Annual Statice, and Yarrow. Strawflowers should be snapped from their stems and when their buds are half open.

Ideas for Dried Flowers:

Wreaths

Bouquets

Swags

Centerpieces

Etc!

TERRARIUMS

A terrarium is a collection of similar plants grown in a glass-enclosed or clear plastic container. The plants grow in a humid atmosphere. A variety of materials such as colored rocks, pieces of lichen, bark and mosses can be added to liven it up. Water cooler and jugs make suitable containers, but any deep glass receptacle - a fish bowl, a storage jar, or an aquarium - can be used, provided it is a clear glass. The container has to have an opening large enough for the insertion of plants. The container can be kept open or closed.

Soil:

An erosion of the soil is extremely important, especially in a closed container. The growing medium should be looser and grittier than for potted plants. A suitable soil mixture can be made with four-parts fibrous loam and one part peat moss. Add a handful of crushed charcoal lumps to keep the growing medium “sweet” and nontoxic. Charcoal also prevents odors in the soil. Sand and small pebbles can be added to help increase the drainage in the soil.

Plant Materials:

First decide on the type of terrarium you wish to make - woodland or tropical. Use a small potted plant or unrooted cuttings. These will root in the moist container. You can collect the woodland plants from the woods. Be sure that the plants you collect are free from disease and insects.

Tropical Plants

English Ivy
Dwarf Coconut
Peperomia
Cryptanthus
Strawberry Begonia

Ferns
Draecaena
Ardisia
Fittonia
Begonias

Haworthia
Philodendron
Echeveria
Croton

Woodland Plants

Ferns
Violets

Wintergreen
Mosses

Wild Strawberry
Seedling Evergreens

Woodland Plants

Ferns
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Wild Strawberry
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Planting

After having decided on the type of planting, line the sides of the container with the woods moss, putting the green side toward the glass. The moss hides the soil and gives the terrarium a green appearance.

Next, depending on the size of the container, put ½ inch to 1 inch of drainage material in the flat bottom part of the container. Do not slope the drainage material up the sides of the container. Then, add soil up to the height of the moss. Before planting, arrange the plants outside of the terrarium to arrive at a pleasing design. With your fingers, scoop out holes large enough to receive the balls of soil or cuttings. Set the plants in and firm the soil gently around the roots. If necessary, prune back large plants or reduce the size of large root balls. Do not crowd the plants or press them against the sides of the container. Do not worry if roots are exposed since they will not dry out in the humid atmosphere. Eventually they will work themselves into the soil.

Exposed soil may be covered with small rocks, pebbles, or moss brushed clean before using. A small figurine, a piece of shelf fungus or a lichen-covered rock may be added as a focal point if additional interest is needed. Usually the plants are interesting enough in themselves that accessories are not necessary.

Watering

After planting, moisten the soil lightly with a bulb sprayer. The soil should be moist, but not soggy. Spray off any particles of soil adhering to the leaves or walls of the container.

Finally, clean the glass with a paper tissue and put on the cover. Since some ventilation is necessary to prevent fogging, the cover need not fit tightly. Adjust the cover so there is always a small opening for air movement. You can make a cover out of pliofilm held with cellophane tape or have one made by your local glass cutter. Goblets, jars, etc., can be effectively covered with Petri dishes.

Care of the Terrarium

Keep the terrarium in bright light, but not direct sunlight. A north or northeast window is a good location. The woodland terrarium should be kept in a cooler room than that in which the tropical one.

Water should be applied only when the soil is less than moist and then sparingly. Depending on the temperature and humidity in your home, the terrarium may need only a few teaspoons of water once a month or even less frequently. To determine if water is needed, dig down into the soil with a spoon. If the soil is dry, apply a very small amount of water and recheck the soil the next day. In time, you will be able to tell by the color of the soil if water is needed. The best way to ruin a terrarium is to keep the soil wet. If you should over water, remove the cover at once and allow the excess water to evaporate.

Section IV

Activities

1. Make a flower arrangement to use as a table centerpiece for your family, or for a special event or supper in your community.
2. Plan a visit to a local florist to learn how they make flower arrangements using cut flowers.
3. Practice making arrangements in different shapes: triangle, circular, crescent, etc. Remember, wildflowers are always great to use for practice if there aren't a lot of flowers ready in your own garden yet.
4. Go to the library and get books on flower arranging to get some tips for your arrangement.
5. Press flowers, leaves, ferns, etc. and make a pressed flower arrangement.
6. Dry flowers, grasses, etc. and make a dried flower arrangement.
7. Start a collection of containers that would be suitable for making flower arrangements.
8. Make a corsage.
9. Make a terrarium