

# Horticulture

## A Greener House



NAME \_\_\_\_\_

AGE \_\_\_\_\_

CLUB \_\_\_\_\_

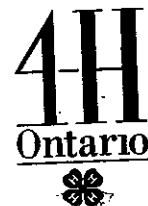
NUMBER OF CLUBS \_\_\_\_\_



Ontario  
4-H Council



Ministry of Agriculture,  
Food and Rural Affairs



4-H 1500 00 ME

The Ontario 4-H Program provides opportunities  
for the personal development of youth.  
<http://www.4-hontario.ca>

### **THE 4-H PLEDGE**

"I pledge:  
My Head to clearer thinking  
My Heart to greater loyalty  
My Hands to larger service  
My Health to better living  
For my club, my community and my country."

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HORT00ME

 **KIDS HELP PHONE**  
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**1-800-668-6868**

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## **Welcome!**

4-H is a program for youth that also involves adult volunteers, parent/guardians and the community. The aim of 4-H is to develop your skills, knowledge and attitudes in the spirit of fun and friendship. The Ontario 4-H Program values the concept of "learn to do by doing" and will continue to support opportunities for experiential learning.

The program also values and encourages grassroots involvement and shared decision making of all participants.

## **INTRODUCTION**

House plants have been grown to brighten the homes of people around the world since ancient times. Not only can we enjoy the beauty of the plants, but growing them gives us a chance to garden all year round. We know that plants are important to the outdoor environment, but our indoor environment also benefits from plants, giving us yet another reason to participate in this hobby.

## **OBJECTIVES**

As a member of this project, you will:

1. Become familiar with many indoor plants and practice growing your own plants,
2. Practice methods of reproducing plants,
3. Learn how to force bulbs and arrange flowers,
4. Learn how to care for indoor plants,
5. See how indoor plants are grown professionally,
6. Examine and try some interesting uses of house plants,
7. Practice judging skills,
8. Practice both leadership and co-operation skills through participation in club activities, and
9. HAVE FUN!

## **GENERAL REQUIREMENTS**

A member will complete a project satisfactorily by:

1. participating in at least 2/3 of his/her own club meeting time;
2. completing the project requirements to the satisfaction of the club leader(s);
3. taking part in an Achievement Program.

## **SPECIAL ACTIVITIES** (Optional)

Individual clubs will decide if junior and/or senior members will be required to complete a Special Activity. Here are some suggestions for Special Activities. Encourage the members to display, present or share in some way the results of their activity. This could be done at a club meeting, the Achievement Program or another 4-H event.

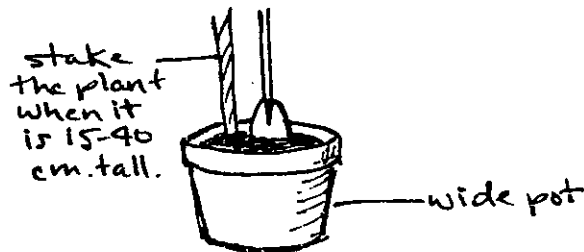
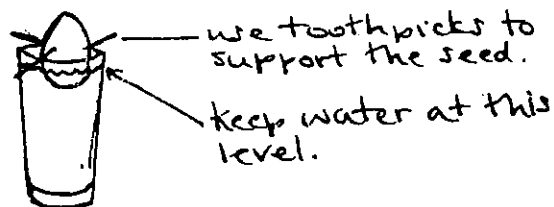
**SENIOR ACTIVITY IDEAS** (Optional)

1. Design your own special activity, with the approval of your leader.
2. Propagate at least three (3) indoor plants. Record the date, plants propagated, method(s) used and the success of each.
3. Build a terrarium or dish garden. Make a list of the plants used. Note which ones were successful or unsuccessful, and why they did or did not do well.
4. Dry and make an arrangement of flowers and other plant material. List the plants used and note how you dried them.
5. Experiment with light conditions. Put one low light plant (e.g. cast iron plant) and one bright light plant (e.g. coleus, African Violet) in a bright spot, and one of each in a dim place. Observe both plants for at least two months. Record any changes. Photograph each before and after.
6. Experiment with grow lights. Compare plants grown in natural light with the same kinds of plants grown under artificial light conditions.
7. Force some bulbs. Try soil and/or water methods of forcing. (You might try crocus or hyacinth with both methods and compare them.) Record date started, kind of bulbs used and date of flowering if possible.
8. Start a bonsai plant or continue caring for one already started. Record the plant name, the design and the basic steps you take. Photograph before and after.
9. Investigate insect control. Identify a pest problem on indoor plants and then try a suggested method of control (no pesticides) as in the Pamper Your Plants section.
10. Work as a volunteer at a local florist shop or greenhouse for a few hours. Report on the experience.

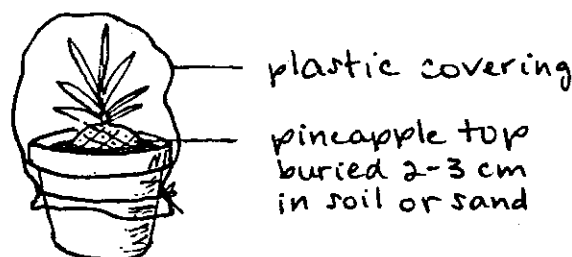
**JUNIOR ACTIVITY IDEAS** (Optional)

1. Design your own project, with approval from your leaders.

2. Grow an avocado plant from seed. Remove the fleshy part of the avocado and wash the "pit", or seed, well. Put three toothpicks into the top of the seed; set the wide end in a glass of warm water, as shown. Place the glass out of direct sunlight. When the "skin" cracks, peel it off and set the seed back in water. The seed should sprout in 2-6 weeks. When the stem is 15-20 cm tall cut it back to half its size so it will branch out. Once the roots are thick and the stem has leafed out, carefully plant your avocado in a pot. When the plant is 15-40 cm tall secure it to a stake for support. The best potting mix is 1 part soil to 2 parts peat moss to 1 part sand (1:2:1). The avocado needs bright light, moist soil and warm temperatures.



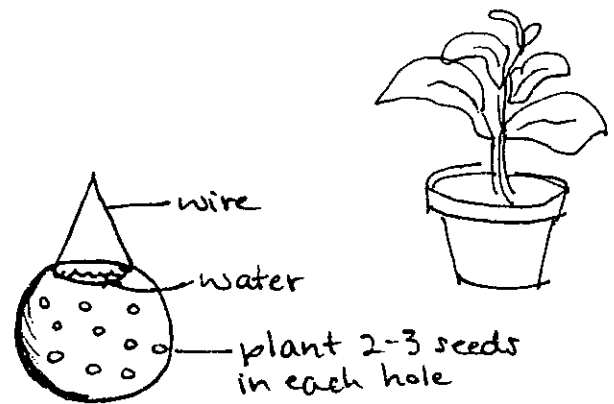
3. Grow a pineapple plant. Choose a pineapple that has a deep orange colour and strong pineapple smell. Cut off the top with about 2 ½ cm of the fruit attached. Set the pineapple top in a pot of sand or soil with 2-3 cm buried as shown. Keep it warm and humid by covering it with a clear plastic bag. Keep it in a shaded but bright place at room temperature. Roots should appear in a few weeks. Pot up so the base is just covered. The best mix is 1 part soil to 1 part peat moss to 1 part sand (1:1:1).



Keep your pineapple plant warm, in a sunny window. Until the roots are well established (a few weeks after potting), water just enough to keep the soil slightly moist. From then on, keep the soil moist.

Once the plant is 60-90 cm tall and healthy, you can try to force it in to flower. Do this by enclosing it in a plastic bag with 2 or 3 ripe apples for approximately 5 days. The apples give off a gas called ethylene, which encourages flowering. Fruit should form afterwards.

4. Grow a turnip window garden. This will make an unusual Christmas decoration. Cut off the top 2 ½ cm of the turnip; hollow out the remainder. Make many holes close together around the outside of the turnip (but don't cut through to the inside). Set 2 or 3 seeds of perennial rye grass or Kentucky blue grass in each hole. Fill the turnip with water and hang it in a sunny window using strong wire. The seeds will start to grow in about 10 days, making the turnip a green ball.



5. Propagate one plant by any method you choose. Make it different from the method used during the Making More session. Record the dates started and rooted, the plant name, method used and rooting medium. It would be fun to try taking leaf cuttings of the yellow-edged snake plant; see if the results are solid green plants as they should be.
6. Try one method of forcing bulbs. Record the date started, bulbs used and date of flowering if possible.
7. Experiment with dry and moist soil conditions. Choose a plant that likes dry soil (e.g. cactus) and a plant that likes moist soil (e.g. Zebrina). You will need two plants of each kind. Keep one of each dry and one of each moist. Record your results.
8. Experiment with leaf colour. You will need two plants of one kind (e.g. spider plant, coleus or other plant with two or more colours). Put one plant in bright light and one in a dimly lit place. Observe leaf colour in both locations. The colours should be better where there is more light.
9. Start some plants from seed. Sensitive plant (Mimosa) is a fun plant to grow. Its leaves fold up fast when you touch them and reopen within a few minutes to a half-hour. Sensitive plant is grown indoors.

Coleus and dusty miller are two other interesting plants to grow from seed. They have pretty foliage. Both can be grown outside in flower beds, pots, etc. Coleus can be grown indoors too. Dusty miller is good when dried for arrangements.

## INDOOR PLANT RECORD

Use the chart below to record information on the indoor plant that you have decided to grow. It would be a good idea to choose a plant from the "Care and Maintenance of Some Easy to Grow Indoor Plants" chart in the appendix page 46. Otherwise, check the growing requirements for your plant before you begin so you know how to care for it.

Plant Name: Common \_\_\_\_\_

Botanical \_\_\_\_\_  
(if possible)

Type of Plant: \_\_\_\_\_  
(i.e., foliage, flowering, cactus, etc.)

Plant's Needs:

Light \_\_\_\_\_ Soil Moisture \_\_\_\_\_

Humidity \_\_\_\_\_ Air Temp. \_\_\_\_\_

Plant's Location in the Home (i.e., sunny south window, table 2m away from window, etc.)

Problems:

Insects \_\_\_\_\_

Poor Growth \_\_\_\_\_

Disease \_\_\_\_\_

Leaf Discolouration \_\_\_\_\_

Others \_\_\_\_\_

# Get Involved!

Be willing to let your name stand for an executive position. It is a rewarding and fun experience. Following your club's elections, complete this club executive chart.

### CLUB EXECUTIVE:

	Name	Phone
PRESIDENT	_____	_____
VICE-PRESIDENT	_____	_____
SECRETARY	_____	_____
TREASURER	_____	_____
PRESS REPORTER	_____	_____
OTHER	_____	_____

### CLUB MEMBERSHIP:

Members, Phone	Members, Phone
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____



Leaders, Phone	Leaders, Phone
_____	_____
_____	_____

4-H Association President, Phone	4-H Association Secretary, Phone
_____	_____

OMAFRA Contact, Phone  
 \_\_\_\_\_



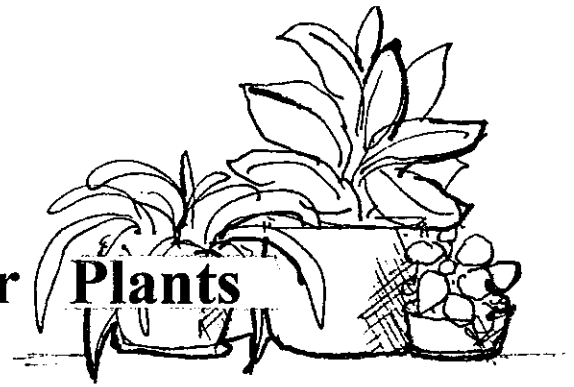
## MEETING SCHEDULE

	DATE	TIME	PLACE
MEETING ONE			
MEETING TWO			
MEETING THREE			
MEETING FOUR			
MEETING FIVE			
MEETING SIX			
ACHIEVEMENT PROGRAM			

The 4-H Resource Development Committee of the Ontario 4-H Council reviews and evaluates 4-H resources. Comments and suggestions about 4-H manuals and guides are always welcome. They may be sent to the following address.

4-H Resource Development Subcommittee  
 Ontario 4-H Council  
 R.R. #1 Thornloe, Ontario P0J 1S0  
 1-800-937-5161  
[lduke@ntl.sympatico.ca](mailto:lduke@ntl.sympatico.ca)

# Introducing... Indoor Plants



## ROLL CALL

Name or describe a plant that grows indoors. Bring it to the meeting if you can.

\*\*\*\*\*

## WHAT A VARIETY

There are many different types of plants that can be grown indoors. Most of these are grown for their attractive leaves (foliage). Many others are grown for their attractive flowers or fruit. Still others are grown mainly for their use in terrariums, dish gardens, bonsai, hanging baskets, etc.

Some house plants can be grown outdoors in planters, hanging baskets or flower beds in the summer. Many are happier outside and are grown indoors to keep them from freezing in the winter. Garden type flowering plants like geraniums and herbs, especially, fall into this category.

Some flowering plants are grown in greenhouses for special occasions. After flowering, most of them are discarded.

## INDOOR PLANTS TO GROW

Here is a list of some common house plants. The common name for each is followed by its botanical name in brackets. Common names are often used for more than one plant so it is helpful to know the botanical name too.

"E" means easy to grow a new plant or easy to keep an older plant growing.

Check off the plants with which you are familiar. At the end of the project, have another look at this list and see how many more you know.

	<u>Plant Names</u>	<u>Easy to Grow</u>	<u>Ones I Know</u>
<b>Foliage Plants</b> (tropicals and subtropicals)	Asparagus Plant (Asparagus)	E	
	Baby's Tears (Helxine)		
	China Doll (Radermachera)		
	Chinese Evergreen (Aglaonema)	E	
	Coleus (Coleus)	E	
	Devil's Ivy (Pothos, also Rhapsidophora)	E	
	Dumb Cane (Dieffenbachia)	E	
	English Ivy (Hedera)	E	

Ferns	
Fig and Rubber Plants (Ficus)	E (some)
Parlor and Reed Palms (Chamaedorea)	
Pepper Face (Peperomia)	E
Piggy-back Plant (Tolmiea)	
Philodendron [fill-o-DEN-drun] (Philodendron)	E
Prayer Plant	
Rex Begonias	
Ribbon or Corn Plants (Dracena)	E
Sensitive Plant (Mimosa)	E
Spider Plant or Grass Lily (Chlorophytum)	E E
Umbrella Tree (Schefflera, also Brassaia)	E
Zebrina [zeb-REEN-a] or Wandering Sailor (Zebrina)	



### Flowering Plants

#### Plant Names

#### Easy to Grow

#### Ones I Know

African Violet (Saintpaulia)	
Azalea [a-ZALE-ea] (Rhododendron)	E
Begonia (Begonia)	
Cape Primrose	E
Chrysanthemum (Chrysanthemum)	E
Geranium (Pelargonium)	
Gloxinia (Sinningia)	E
Hibiscus	
Hoya	E
Hydrangea [hi-DRAIN-jee-a] (Hydrangea)	E E
Kalanchoe [cal-AN-co-ee] (Kalanchoe)	
Orchids	
Peace Lily (Spathiphyllum)	
Poinsettia (Euphorbia)	



### Fruiting Plants (tropicals with ornamental fruit)

Avocado (Persea)	
Jerusalem Cherry (Solanum) - this plant's fruit and leaves are very poisonous.	
Orange and Lemon (Citrus)	
Pineapple (Ananas)	

### Cacti and Other Succulents (tropicals)

Aloe (Aloe)	
Bunny-ears (Opuntia)	E
Christmas Cactus (Schlumbergera)	E
Crown-of-Thorns (Euphorbia)	E
Jade Plant (Crassula)	E
Jellybean Plant (Sedum)	E
Snake Plant (Sansevieria)	E



Herbs (grown for edible use)      Chives (Allium)  
                                  Parsley (Petroselinum)  
                                  Rosemary (Rosemarinus)  
                                  Sweet Basil (Ocimum)  
                                  Thyme (Thymus)

**Note:** Succulents have thick, juicy stems and leaves. Cacti usually have thick, juicy stems and, instead of leaves, they have spikes.

Tropical plants are ones that grow outdoors in hot and humid climates.

Sub-tropical plants grow in slightly less hot and humid climates.

**Tip:** Before choosing a house plant to adopt, do a little research. Some of the plants listed above are dangerous if eaten by small children or pets. Make sure that you look your plant up in a good house plant reference book so that you know if it has any negative side effects.

### **BEST FOR BEGINNERS**

In most homes, the easiest plants to start to grow and keep healthy are from the "foliage" and "cacti and other succulents" groups. Flowering and fruiting plants and herbs have needs which are harder to fulfil. If you are a beginner at indoor gardening, try some of the "easy to grow" plants. See the chart for the "Care and Maintenance of Some Easy-to-Grow Indoor Plants", in the appendix page 47, for more information.

### **BARE NECESSITIES**

You don't need much to get started at indoor gardening. A few basics as listed here are enough:

- good potting soil (discussed in the Making More section),
- a selection of clean pots,
- trowel,
- watering can, and
- indoor plant fertilizer.

Extras that you might need:

- artificial lights, and
- specialty items, e.g. stakes, special containers, etc.

### **BEFORE THE NEXT MEETING**

1. Note three reasons why you want to grow house plants.

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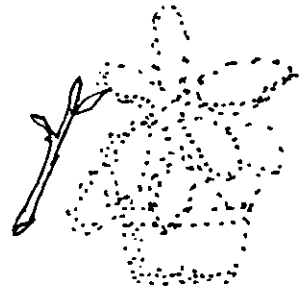
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2. Obtain an indoor plant to start growing as your own. Start keeping records on the Indoor Plant Record sheet on page 5.
3. Look over Junior and Senior special activities (optional).
4. The next meeting will include starting and potting plants, so it will be messy. Dress appropriately!

# Making More



## ROLL CALL

Name an interesting feature of a particular house plant.

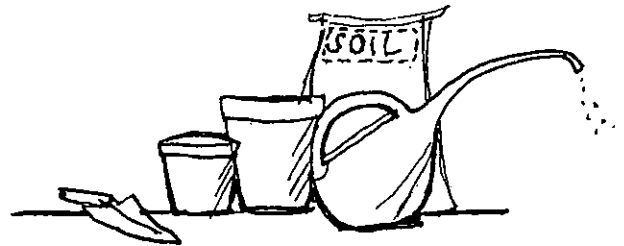
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Part of the fun of growing house plants is starting more plants. This is known as **propagation**. There are several methods of propagation. Cuttings, air layering, division, offsets, runners and seeding will be discussed.

## PROPAGATION PROPS

Before you start, you will need the materials in the following list.

- rooting mixtures
- clean, sharp knife
- clean pots or deep trays - pots could be clean plastic, fibre or clay and trays could be clean plastic, fibre or wood. Scrub used plastic or clay ones with a mild bleach solution (add one capful of bleach to 2 litres of soapy water) and rinse before use. Make sure the pots and trays have drainage holes.
- glass jars or sheets of glass or plastic with small holes
- labels
- elastic bands or string (for air layering)
- bobby pins or paper clips (for some runners)



## ROOTING MIXTURES

These are more correctly called rooting media. Rooting media are what new roots are grown in. Here is a list of them.

1. **Soil** - regular garden soil or commercially available potting soils are too heavy to allow roots to grow if used alone.
2. **Perlite** - a white volcanic ash, which improves drainage. It may be used alone for cuttings.
3. **Vermiculite** - an expanded mica made from rock, which improves drainage and holds water. It is messy if used alone.
4. **Sphagnum peat moss (pre-soaked)** - improves drainage and holds water.
5. **Coarse sand** - improves drainage. It is too sharp for most new roots if used alone.

Any of ingredients 1-5 may be mixed to make a good rooting medium. If the mixture is to be reused, it should be sterilized to kill any diseases. This is explained in the Digging Deeper section.

6. **Water** - may be used for some cuttings, e.g., coleus, geranium, ivy, zebra. The roots will be very tender though and must be handled gently. Rooting in water results in water roots that are not particularly functional when transplanted in medium. The plants listed above are fine when rooted in water then transplanted to medium or soil.

### ROOTING ATMOSPHERE

You should be prepared to create an atmosphere that will encourage roots to form quickly. A good atmosphere is one which is:

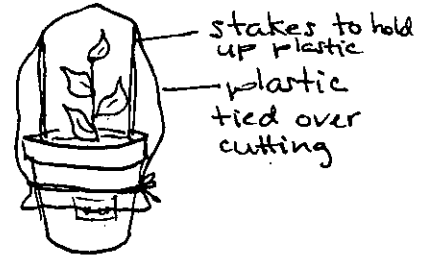
- warm,
- humid, and
- away from direct sunlight



You can create this atmosphere by:

- covering the cuttings or seeds with clear glass or plastic; and
- keeping them in a bright window until the new plants have started growing well. The bright light will help warm the microclimate to the 22-25°C temperature considered ideal to achieve rapid rooting.

flat of cuttings covered with plastic held up with stakes



stakes to hold up plastic  
plastic tied over cutting



glass inverted over cutting

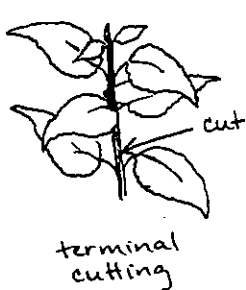
#### **TIPS:**

- Choose healthy plants free from insects, disease and nutritional problems
- Choose plants which aren't blooming (flowering discourages rooting).

## METHODS OF PROPAGATION

1. **Stem Cuttings** - the most common method and very easy to do. This is a good method for plants such as coleus, chrysanthemum, geraniums, ivy, peperomia, weeping fig and zebra.
  - The cuttings may be taken from end growth (called terminal cuttings) or by cutting the stem into several sections (sectional cuttings). Most plants root best as a terminal cutting.

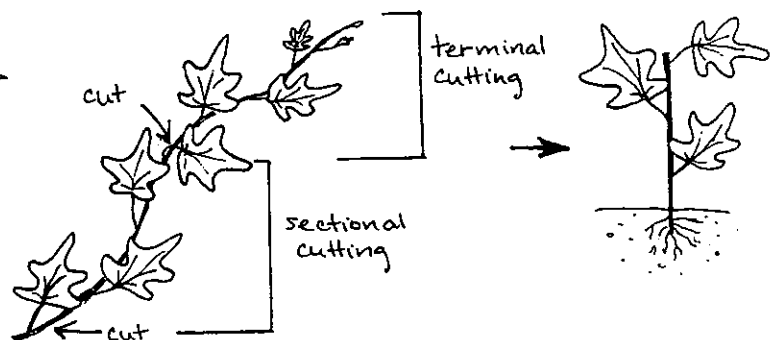
Coleus



Method

- Cut the stem into 7-10 cm long sections with a sharp knife. Remove lower 1-2 leaves.
- Dip cut end in rooting hormone if desired. Remove excess.
- Place the cutting firmly in the moist rooting medium.
- Water lightl<sup>y</sup> to firm media and ensure enough moisture.
- Cover loosely with a glass or plastic.
- Place out of direct sunlight, but in direct light.
- Check for roots in 2-4 weeks. Check by gently tugging at the cuttings.
- Don't pull out the whole cutting too often.
- Pot up when roots are about 2-1/2 cm. long.

English ivy

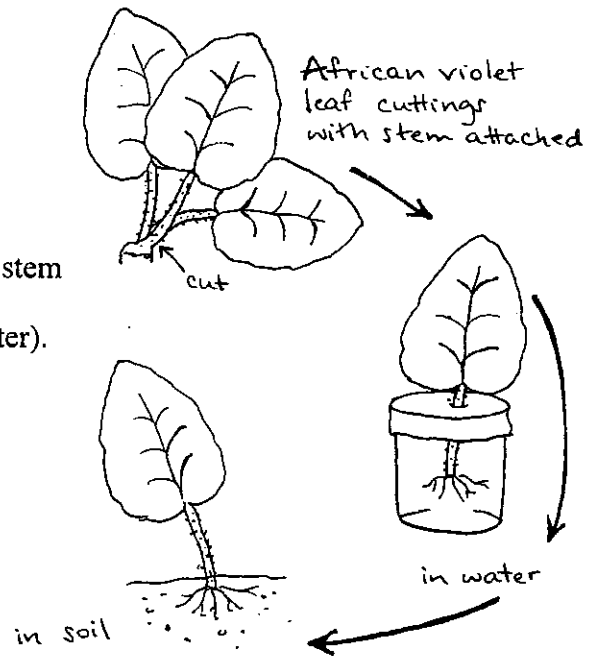


2. **Leaf Cuttings** - for plants with fleshy stems.

- A) Leaf with its stem attached - used for African violet, gloxinia, peperomia, streptocarpus, jade, etc.

Method

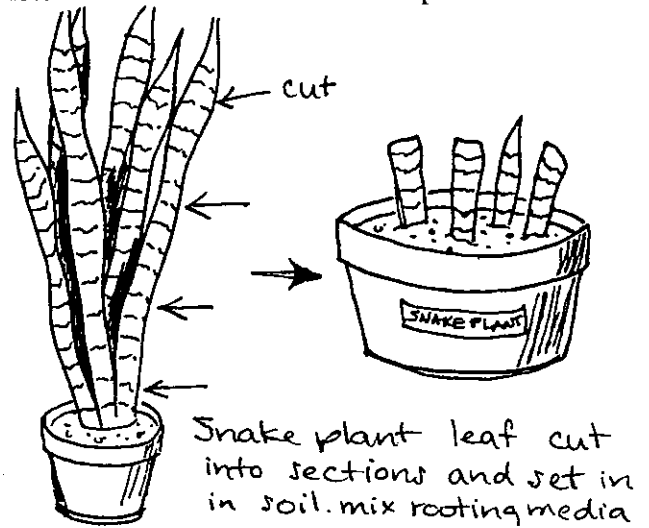
- Cut off the whole leaf where it joins the main stem of the plant.
- Set it in a moist rooting medium (may use water).
- Label and cover with glass or plastic.
- Check for roots in about 2-4 weeks.
- Pot up.



- B) (i) Leaf cut into sections - used for snake plants. (Note: The variety with yellow-edged leaves will always produce a green plant; the division method should be used to produce a new plant with yellow-edged leaves.)

Method

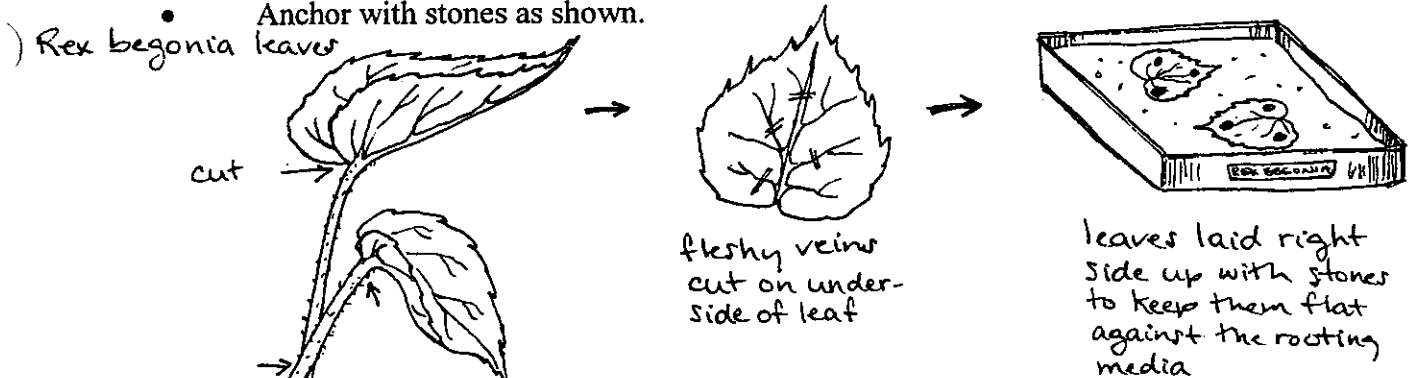
- Cut off the leaf.
- Cut it into 7-8 cm. sections. Note which end is the bottom.
- Set sections, with the bottom end down, in a moist rooting medium. If set upside down, they will not develop roots.



- (ii) Leaf laid on rooting medium - used for some fleshy veined leaves, such as African violet, kalanchoe and rex begonia.

Method

- Cut the leaf off at the base of the leaf blade.
- Make several cuts across the main fleshy veins on the under side of the leaf.
- Lay the leaf right side up in a moist rooting medium.
- Anchor with stones as shown.

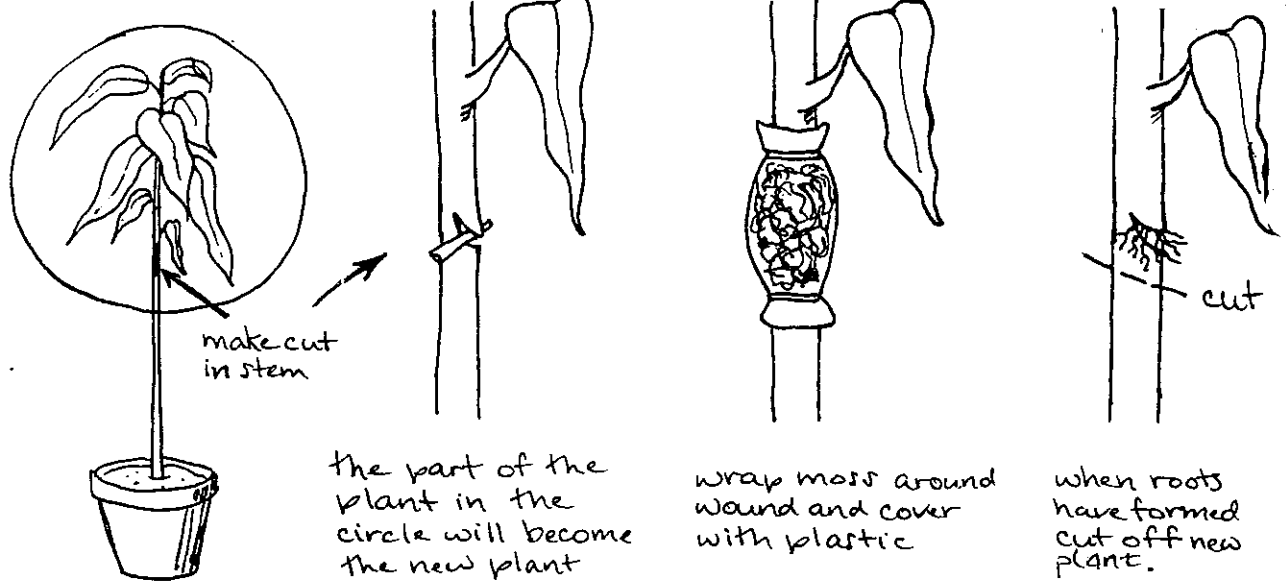


3. **Air Layering** - a difficult method which is used for hard to root plants or ones which get tall and leggy with woody stems, e.g. corn plant, dumb cane, philodendron, rubber plant and umbrella plant. Plants with long, bare stems and leaves at the top are not attractive. Shortening these plants gives leafy, attractive "new" plants.

Method

- Make a cut in the stem, where you would like new roots.
- Cut 1/2 way into the stem at an upward slant.
- Hold the cut open with a small stick or pebble.
- Wrap a handful of well-moistened (but not wet) sphagnum moss around the wound. Peat moss could be used instead, but it is messier.
- Completely cover the moss with plastic wrap and tie the top and bottom with elastic or string.
- Roots should be seen in the moss in about 3-5 weeks.
- At that time, cut off the stem right below the new roots.
- Pot up the new, shorter plant. The old plant will usually produce new shoots.

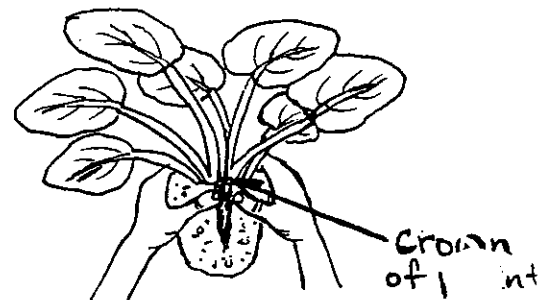




4. **Division** - easy to do and you get a new plant instantly. It is used for plants with more than one stem coming up from the soil or with more than one crown (the crown is the growing point of the plant at the soil surface). It is used for African violet, cast iron plant, many ferns, snake plant, spider plant, rex begonia, etc.

Method

- Remove the plant from the pot. Turn the pot upside-down and rap it firmly while holding the plant in the other hand.
- Shake the excess soil off the roots so you can see where the plants join.
- Gently pull or cut the plants apart, making sure that each plant has a good share of roots.
- Repot the new plants.
- Water thoroughly.

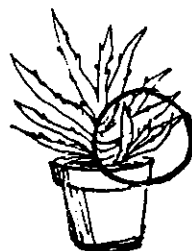


division of African violet

5. **Offsets** (or plantlets) - easy method and you get new plants instantly. It is used for plants which produce new plants at the base of the stem, e.g. aloe and bromeliads (bro-MEAL-ee-ads).

Method

- Remove the offset with a careful twist or pull.
- Pot up.



Aloe offset becomes a new plant



6. **Runners** - for plants that produce long shoots from the main plant. Small plantlets develop at the tip of the runners, e.g. spider plant, strawberry geranium.

Method

- Lead a runner with a plantlet to a pot filled with potting soil.
- Anchor it with a paper clip or bobby pin.
- Cut the runners from the parent plants in 2-3 weeks when roots form.



this rooted plantlet can be cut off and potted up

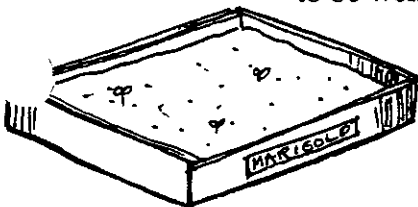
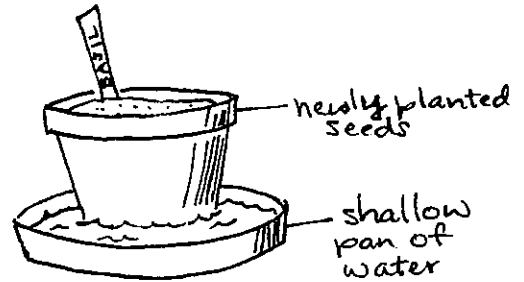
anchor unrooted plantlet in potting soil mix

**Tip:** Sometimes the plantlets have roots already formed. These plantlets can be cut off and immediately potted like a cutting.

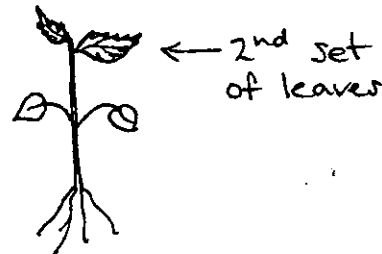
7. **Seeding** - used mostly for flowering annuals and herbs.

**Method**

- If seeds are tiny, sprinkle them on top of the moist medium. Leave them uncovered.
- If seeds are large, sow them as deep as they are wide.
- Label and cover the container loosely with glass or plastic.
- Keep the soil moist, but not wet. Water by lightly sprinkling or water from the bottom, so the seeds don't move (see diagram).
- Remove glass or plastic cover as soon as the seeds have germinated.
- Pot up when the second set of leaves is showing and the seedlings appear to be well established.



*This whole flat can be covered with a sheet of plastic.*



*pot up seedlings at this stage*

### POTTING TECHNIQUES

Prepare a pot with a mixture of:

- a) for most house plants: 1 part moist potting soil to 1 part moist peat moss to 1 part washed coarse sand or perlite (1:1:1), or
- b) for cacti and succulents: 1 part moist potting soil to 1 part moist peat moss to 2 parts washed coarse sand (1:1:2).

The potting soil and peat moss will absorb water better if they are moistened before they are mixed.

Instead of these mixes, you can buy a good potting mix made especially for certain plants. e.g. cacti mix.

**Method**

- Place a layer of gravel over the bottom of the pot. This is only applicable if using clay pots and even then, it is not absolutely necessary.
- Fill the pot with potting mix.
- Lift the rooted cutting, seedling, runner, plantlet or air layered plant gently; the new roots are tender.
- Set the "new" plant into the pot filled with potting mix. With your finger, make a hole big enough for the roots. Place the "new" plant in the mix, so the roots are completely covered. Gently firm the soil around the roots and stem.
- Water so that the soil is completely moistened.
- Care for the plants the way you did for the parent plant.

**BEFORE THE NEXT MEETING**

1. Perform one method of propagation on a house plant.

**Record:**

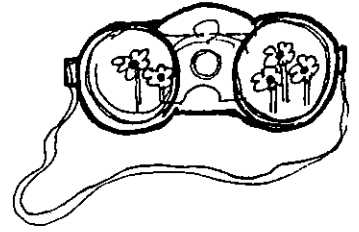
Plant name or description \_\_\_\_\_

Method of propagation \_\_\_\_\_

Date done \_\_\_\_\_

Rooting or potting medium \_\_\_\_\_

2. Start caring for your indoor plant, if you haven't already.
3. Choose and start your special activity if your club has decided to do one.
4. Prepare some flowers to bring to the next meeting. Your leader will suggest some ideas.



# Focus on Flowers

## ROLL CALL

Tell what plant you propagated and the method of propagation you used.

\*\*\*\*\*

A good way to brighten your home is by using forced (grown out of season) bulbs and flower arrangements. Bulbs are usually forced for winter and spring enjoyment. Cut flowers may be enjoyed at any time of the year, thanks to greenhouses. You can dry flowers and other plant material and use them in arrangements too.

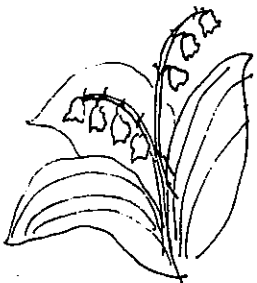
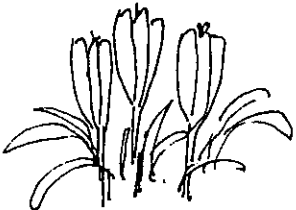
Let's take a look at how you can force bulbs.

## WHICH BULB IS WHICH?

There are two types of bulbs which are easily forced in the home - hardy and tender tropical.

### HARDY BULBS

1. Crocus - These small purple, blue, yellow or white flowers bloom outside as soon as the snow disappears.
2. Daffodil - These flowers have "trumpets". While yellow is the most common colour, there are orange, yellow and white combinations too.
3. Grape Hyacinth - Because these tiny blue flowers are tightly clustered on a spike, they look like grapes. They are very easy bulbs to force.
4. Hyacinth - These very fragrant spikes of flowers commonly come in blue, pink and white colours.
5. Lily-of-the-Valley - These tiny, creamy flowers are fragrant. You might find them in a bridal bouquet. The "bulbs" (or "pips") can be forced at any time of the year.
6. Tulip - The most popular bulb. The flowers come in a wide variety of colours and shapes. We associate it with Holland and Ottawa.



## TENDER TROPICAL BULBS

1. Amaryllis (am-are-ILL-is) - These large, beautiful flowers are most common in red, but there are pink and white mixes too. After blooming, the bulbs should be watered and fertilized until fall to resize the bulb. Allow the plant to dry before beginning to force again.
2. Tender narcissus (nar-SISS-is) (paper whites, golden Soleil d'Or, and Chinese sacred lily) The bulbs of these delicate flowers are forced in water. The bulbs are useless after forcing so should be discarded.

## THE HOW TO'S OF FORCING BULBS

### MATERIALS YOU NEED

- Containers - wide (12-15 cm.), shallow (10 cm.) pots with drainage holes are best.
- Sterile soil mixture - you can buy a mixture made for bulb forcing or make one of these:  
 1 part garden soil to 1 part peat moss to 1 part sand (1:1:1),  
 1 part vermiculite to 1 part peat moss to 1 part sand (1:1:1),  
 1 part peat to 1 part sand (1:1), or  
 1 part vermiculite to 1 part peat moss (1:1).

Choose large, plump, firm bulbs free from blemishes, marks, cuts, etc. Beginners should make sure to choose bulbs marked "suitable for forcing." If bought or dug too early, most bulbs can be stored in a cool, dry, dark place until you are ready to plant e.g. garage or basement. Tender narcissus should be stored at room temperature. Generally, the smaller the bulbs (e.g. crocus is smaller than tulip), the earlier they will bloom. Early varieties can be forced faster than later varieties of the same kind of flower.

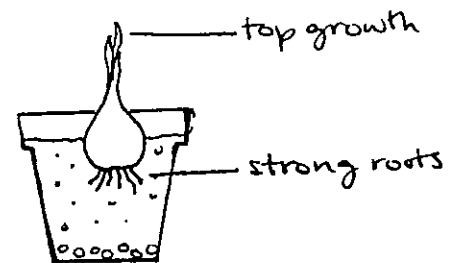
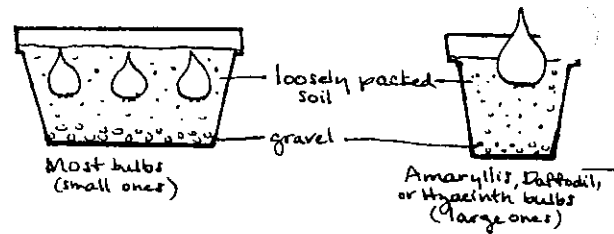
Most bulbs are best forced in potting soil. The hardy bulbs and amaryllis prefer this method. However, some bulbs can be forced in water, e.g. tender narcissus, crocus and hyacinth.

Hardy bulbs and amaryllis, started in mid-October, will bloom in February. Tender narcissus, started in mid-October, will bloom by December.

### SOIL FORCING

- Half-fill the pot with the soil mixture.
- Set bulbs in mixture close together but not touching each other or the sides of the pot.
- Add soil to cover the bulbs, except amaryllis, daffodil and hyacinth bulbs. The necks of these bulbs should not be covered.
- Label.
- Water thoroughly.
- For strong root development, store potted bulbs in a cool, dark location (5-10°C), e.g. in cellar or garage for 4-8 weeks. Keep the soil moist to encourage good root development.

- When the root system is strong, there should be about 5 cm of top growth. Move the bulbs to a warmer (10-15°C) brighter location out of direct sunlight for 2-3 weeks. The bulbs will have a chance to adjust to the light while roots continue to develop.
- When the flower buds are showing some colour, move them into full light at 18-20°C. A cool window is good, out of direct sunlight. Keep bulbs moist. Plants require plenty of water while blooming.
- To delay or suspend the growth after the eight week rooting phase, place the pots in a root cellar or a suitable location where the temperature is in the 1-2 degree C. range. This could be the garage, or an outside cold frame, using straw or leaves to protect the plants from freezing. Bring in for forcing approximately three weeks before desired date of flowering.
- Continue to water and fertilize plants after blooming when the foliage can be cut down and the bulbs planted in the garden.
- They will not reflower again until the following spring. However, planted outdoors, the bulbs will enlarge in size producing large blooms again by the second growing season.



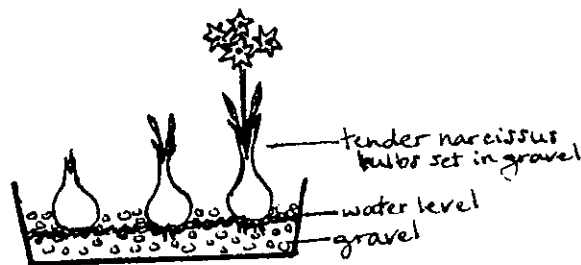
**TIP:** Forcing bulbs too early or too fast (i.e., where it is too warm) will ruin the flower buds.

- You should also remember that forcing a bulb drains a lot of its stored energy that produces a flower. It may take as long as three years before a forced bulb can produce a flower again in your outdoor garden.

## WATER FORCING

There are special glasses that can be used for crocus and hyacinth bulbs. These glasses hold the bulbs just above the water level.

- Fill pot or bulb pan with gravel 2 cm from the top.
- Set the bulbs firmly in the gravel so that the bottom 2 cm of the bulbs are covered with gravel.
- Add water so it is 2-3 mm below the bottom of the bulbs. Keep the water at this level during the forcing period.
- Put tender paper white narcissus bulbs in a cool (15°C) well-lit location. They will flower in 4-6 weeks. Crocus and hyacinth bulbs should be treated the same way as when soil forced, ie. stored in a cool, dark place until roots develop and tops start to grow; then gradually brought into warmer and brighter conditions. Forcing time is the same for water and soil methods.
- Remove flowers after blooming.
- Continue to water until the leaves die down. Then remove the bulbs and plant them outside for flowering the following spring. (Hardy bulbs are best if not forced again, and you would most likely not be able to force another flower from the same bulb.)
- Amaryllis bulbs will die if left outside for the winter. Dig and repot them before frost, storing them for another season of forcing. If not potted soon after digging, all existing roots will shrivel and die. Let the foliage dry down naturally or cut down to the top of the bulb neck. Often the best way is to leave the plants in the pots, and put them in the garden or patio for the summer to allow replenishment of the bulb with food.



## FLOWERS FOR ARRANGING

Flowers for arranging can be purchased or grown yourself. Many annuals are particularly good to cut and use fresh for flower arranging. Others may be dried and used in the winter.

You can dry some flowers by setting them in a special drying material in airtight containers. Silica-gel is a common drying agent. Other flowers dry well if hung upside down in a warm, dry place.

Here is a list of some annual flowers you may find easy and fun to grow to use in fresh or dried arrangements.

### **Dried**

Baby's breath  
Bells of Ireland  
Carnation  
Cornflower  
Marigold  
Strawflower  
Statice  
Zinnia



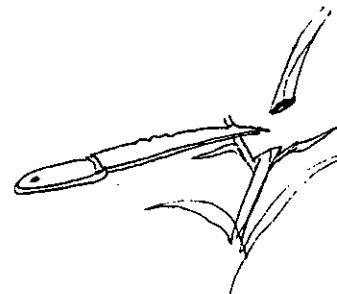
### **Fresh**

Calendula  
China Aster  
Nasturtium  
Cosmos  
Pansy  
Petunia  
Snapdragon  
Sweet pea

## HOW TO CUT FLOWERS

Tools for cutting and arranging flowers are listed below.

1. A sharp knife.
2. a) A pinholder and florist clay for fastening the pinholder to the bottom of the container  
\*or you can use:  
b) Oasis (a plastic foam) soaked in water.  
Both a pinholder and oasis hold the flowers in place in the container. Remember that there are two different kinds of oasis; one for fresh flowers, and another for dried flowers.
3. A container that is suitable to the type of arrangement.



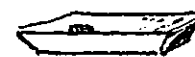
## HARVESTING FLOWERS

1. Cut in the morning to ensure freshness.
2. Cut stems on an angle with a sharp knife, scissors or garden tool. A cut just above a side branch encourages more blooms.
3. Remove leaves from the lower 10-15 cm of the stem.
4. Once all flowers are collected, recut the stems, removing 3-5 cm.
5. Immediately plunge the recut stems into a pail of clean, warm water (40-45°C) containing floral preservative if possible. Steps 4 and 5 ensure that water will move quickly up the stems.
6. Place the container of flowers in a cool, shaded spot for at least 2 hours so the flowers will become crisp again. A cool basement is ideal.
7. Arrange the flowers as you wish.

## DOs AND DON'TS OF FLOWER ARRANGING

### **Do...**

- √ Choose a good container.  
Some are suggested in the diagrams here.
- √ Keep larger flowers down low and smaller ones high and to the outside.
- √ Hide the pinholder or oasis with foliage.
- √ Cover the edge of the container (especially at the front) with flowers or foliage.
- √ Strip off any leaves that would be in the water.
- √ Cut stems on an angle to make it easier to put them into oasis.
- √ Water your arrangement every day.



GOOD CONTAINERS



too narrow necked



too decorative

POOR CONTAINERS



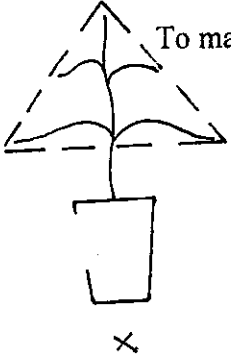
**TIP:** You can add flower preserving powder to the water to feed the flowers, kill bacteria and acidify the floral solution allowing water to go up the stem faster. You can buy it at your local florist shop.

### Don't...

- ⊗ Use clear glass containers. Stems and holders that are easy to see are not attractive.
- ⊗ Cross stems.
- ⊗ Crowd flowers.
- ⊗ Keep adding flowers just because you have them.
- ⊗ Use too many different types of flowers and foliage in one arrangement.

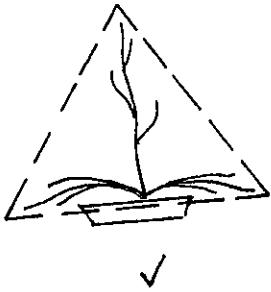
### DESIGN GUIDELINES

To make an arrangement look pleasing, there are four main rules to guide you.

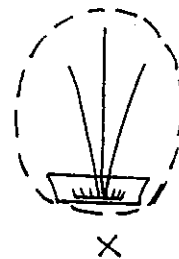


2.

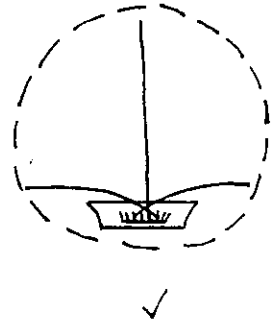
**Proportion** means that the size of the design suits the container size. A general rule is to have your tallest stem  $1\frac{1}{2}$  to 2 times the height of the container. If using a low container, then  $1\frac{1}{2}$  to 2 times its width.



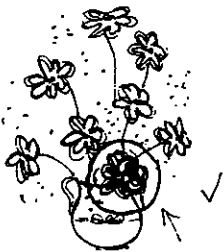
1. **Balance** occurs when an arrangement is designed so it doesn't look like it is going to tip.



arrangement is too small for the container.



3. **Focal point** is the eye-catching part of the design. In order to achieve this effect, place the largest, the most open, the brightest or the darkest coloured flower(s) low at the front.



- no focal point  
- no rhythm (or flow)  
- plant material is a little too heavy for a sugar bowl container

4.

**Rhythm or flow** is the way your eye moves from one part of the arrangement to another. It is done by placing flowers at different heights rather than in a row. You can also create rhythm by placing flowers of the same colour in the arrangement up, down, or in a pattern through the design. The viewer's eye will naturally be drawn to the same flowers, or darkest colours etc.

**TIP:** When using just a few flowers in a design, an uneven number of flowers is best, i.e., 3, 5 or 7 instead of 2, 4 or 6. When using large heavy flowers like zinnias or marigolds, soften the arrangement with other light, feathery flowers like baby's breath or select greens and spike type flowers like liatris, or delphiniums.

## BASIC DESIGNS

There are many designs from which to choose. We will look at three of them in some detail.

### 1. **The Triangle Arrangement** - with all sides equal.

- It is best to try this arrangement using only one kind of flower when you are practising, e.g. try zinnias, marigolds, chrysanthemums or carnations.
- Choose your container. Keep in mind that the container should match the flower type too, e.g. pottery with a heavy looking flower and china with a dainty flower, etc.
- Also remember that the colour of the container you choose is important. Neutral or earth tones will make your design stand out more.
- Choose your holder carefully. If using a pinholder, fasten it securely to the bottom of the dry container. If using pre-soaked oasis, cut it to fit snugly inside the dish and come 1-2 cm. above the rim. Floral tape will also help to keep the oasis in place; but it will only stick while the container is dry.
- Now place the tallest stem near the back of the holder, leaning it back slightly. Then add two stems at either side to make an equal sided triangle as shown.
- Fill in the design, cutting stems to the right lengths. Remember that the largest flowers form the focal point.
- Fill in the back spaces with foliage.

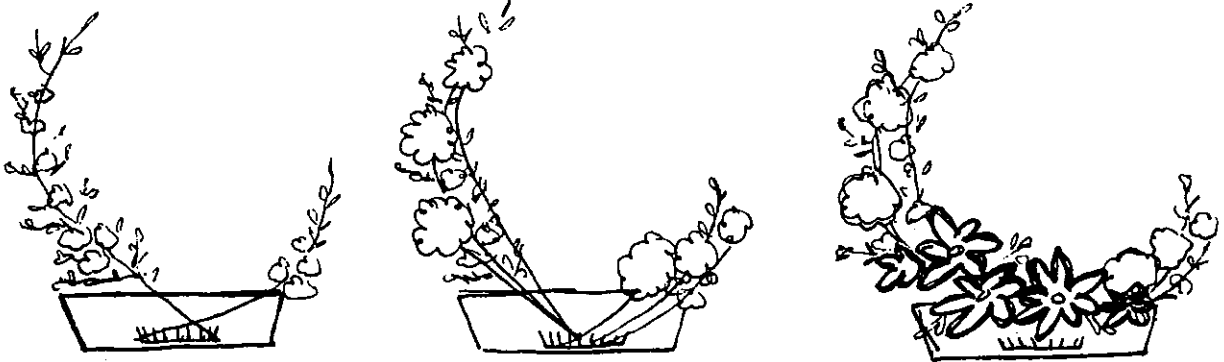


### 2. **The Crescent Arrangement**

- This design needs two shapes of plant material:
  - a) some with a natural curve, e.g. small leaved branches of spiraea or cotoneaster or wild grasses;
  - b) some round flowers, e.g., marigolds or chrysanthemum in different sizes.
- One side of the arrangement should be higher than the other, as shown.

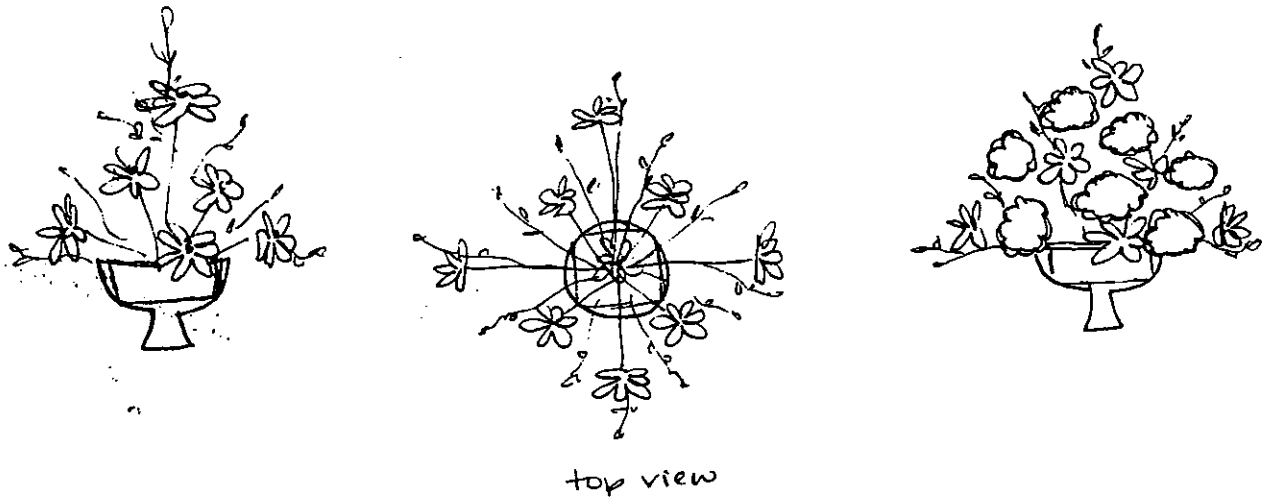


- Low dishes are good containers. Footed bowls (like the one on the right) are the best containers.
- Choose curved stems; cut to the right length and set securely in the holder.
- Place a few longer stemmed, smaller flowers in next, as shown.
- Fill in the centre with larger flowers. This is the focal point.
- You could add a few larger leaves down low, but not enough to ruin the curve.



### 3. The Table Arrangement (or all-round arrangement)

- This design is viewed from all sides. For people to be able to see each other over it at the table, it must be no higher than 30 cm (including the container). Almost any shape of flower and foliage (except spike shapes) is fine for this type of arrangement.
- Oasis is the best holder to use for this arrangement.
- Place the tallest of the flowers in the centre. Add a few flowers to form a circle.

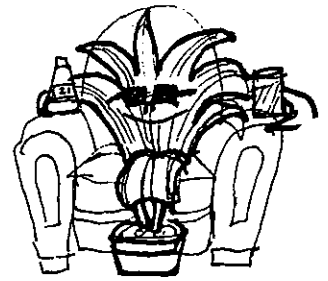


- Add more flowers of the same or a different kind. Turn the arrangement as you go to make sure it looks good from all angles.
- Finally, add pieces of foliage to separate the flowers and soften the design.



**BEFORE THE NEXT MEETING**

1. In a magazine or floral design book. Find two other examples of flower designs. Copy, sketch or clip out and include in your manual. Bring them to the next meeting.
2. If you can, bring an ailing plant to the next meeting for the troubleshooting activity.
3. Continue keeping records for your indoor plant.
4. If you are doing one, start your special activity. Seniors; if forcing bulbs for your special activity or for the Achievement Program, start planning now.



# Pamper Your Plants

## ROLL CALL

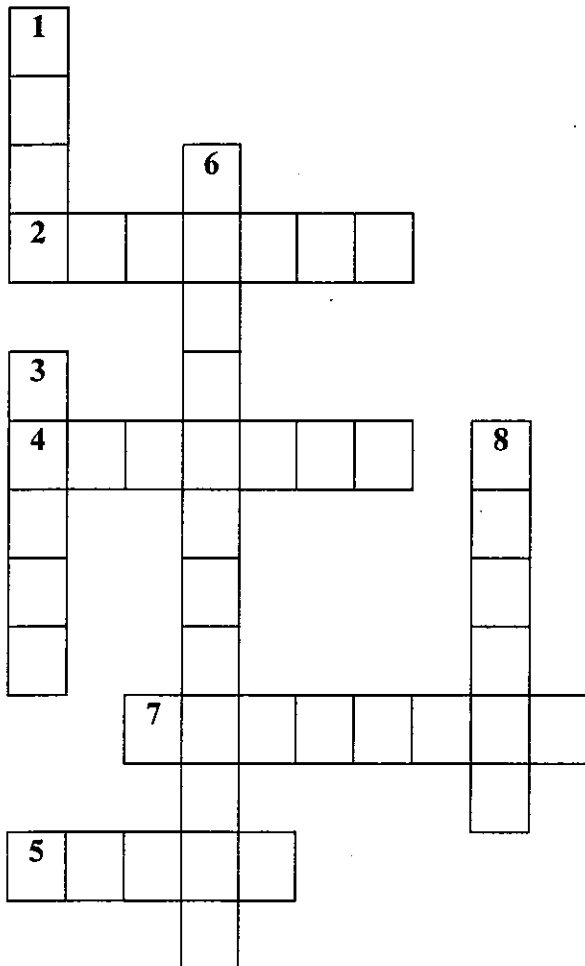
Show one floral arrangement you found for your home activity. Where might you set such a design in your home?

\*\*\*\*\*

It is important to learn how to care for your plants. A healthy plant adds a pleasing appearance to the room; an unhealthy plant can be an eyesore. Just as we can control our environment indoors, we can control the indoor environment for many plants too. These container-bound plants can't look after themselves, though. We must make the conditions right for them.

## WHAT DO PLANTS NEED?

Fill in this crossword puzzle to find elements to consider when thinking about keeping a plant healthy.



### Across

2. Plant infection
4. Little plant pests
5. Absolutely necessary for plant and animal life.
7. Plants are healthiest when this air quality is 60-80%.

### Down

1. Fertilizer is a form of plant \_\_\_\_\_.
3. The sun is a good source of this.
6. Plants can't survive either extreme hot or cold \_\_\_\_\_.
8. All of these things are important to a plant's \_\_\_\_\_.

## WATERING DOs

Plants must have some water to survive; however, too much water can damage or even kill them. Overwatering is the most common problem for house plants.

### DO's

- X Use lukewarm water.
- X Water when soil feels dry when you lightly press your finger on it.
- X You will not have to water as often in the winter.
- X Soak the soil thoroughly.
- X It is best to water in the morning, when the temperature is rising; the plants need the most water at this time.
- X Try not to get water in the crown (centre) and on the leaves of plants (with furry leaves especially, e.g. African violet). The leaves may develop patches of rot or rot off at the bottom if water is left on them.



## FERTILIZER AS FOOD

Just as we need certain nutrients, so do plants. Plants in pots get a limited amount of food from their soil. So, we must feed them fertilizer to give them their nutrients.

There are three major elements (or main nutrients) that plants need. They are:

- Nitrogen (N) for healthy green foliage,
- Phosphorus (P) for strong, healthy roots and flower, fruit and seed development, and
- Potassium (K) for the uptake of nutrients used for strong root and stem development.

Plants also need some minor or trace elements (ones needed in small amounts). These are: magnesium, sulphur, calcium, boron, zinc, copper, iron, manganese, sodium, molybdenum, and cobalt.

Usually outdoor plants can get enough of these trace elements from the soil. This is why most fertilizers contain only the three major elements, N, P and K. Because house plants don't get these trace nutrients from the soil, there are water soluble fertilizers that supply the plants with micronutrients. The amounts of each of the nutrients in the fertilizer make up the numbers you will see on the container, eg. 1N-2P-1K and 10N-15P-10K.



Man-made fertilizers are the most common ones used for indoor plants. They come in forms such as these:

- crystals
- powders
- concentrated liquid

You must be very careful to mix these exactly as directed with the proper amount of water. Read the label carefully. Too much fertilizer damages the roots and the rest of the plant too.



## WHEN TO FERTILIZE

- Newly potted plants don't need fertilizer for one to two months.
- Only feed plants when they are putting on new growth. This is when the roots are able to absorb the nutrients, e.g. tropical foliage plants don't need to be fertilized from October-February. Flowering plants require less when not actively growing or flowering, particularly during low light periods. Fertilize every three to four weeks during active growing periods ie. March 15-September 15.
- Feed a healthy plant only. Fertilizing a weak plant may cause further damage.

## LEACHING THE SOIL

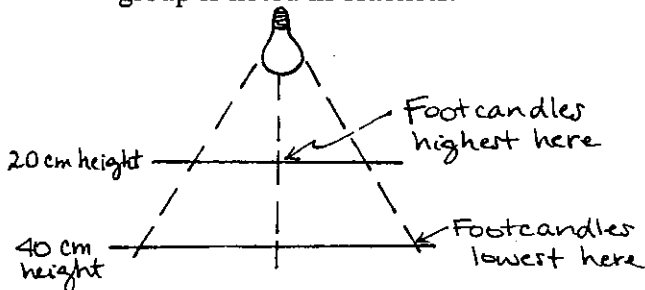
When you see crusty white deposits on the soil surface, it means that there is too much salt in the soil, which is not good for the plant. Symptoms of high salts will also be on the plants: marginal burn of older leaves, crinkling of new leaves, leaf colour a dull green and/or the plant wilting, but the soil still wet. Remove the deposits. Then water very thoroughly. Let the plant's soil drain for a half-hour and water again, making sure that about one third of the water drains through the pot. The water dissolves the salts and washes them away. This process is called leaching. Removing old media from around the roots and replanting in new media can be done instead of leaching.

## REPOTTING PLANTS

Most houseplants, including larger plants such as weeping figs, palms, etc., should be repotted every 1 to 2 years. Repotting will help provide the proper drainage and aeration. Over time, the structure of the media breaks down, resulting in water logging, which leads to root rot. Repotting rejuvenates plants because it gets rid of undesirable compounds and the pH is again within the desirable range.

## LIGHT REQUIREMENTS

Plants must have light so that they can process their food and grow. Different plants need different amounts of light; they can be divided into three classes: 1) bright, 2) moderate and 3) low light plants. Light is measured in foot-candles (brightness of light) and the amount for each group is noted in brackets.



- Plants directly under the light source get the most foot-candles or brightness of light.
- Plants further away from the light source get less foot-candles or brightness of light.

### 1. **Bright light** - (650-1400 foot-candles)

These plants need at least 4 hours of bright sunlight each day. A sunny, south or west (in summer) window is good. Examples of some plants in this category are:

- most flowering plants and bulbs;
- cacti and many succulents;
- croton and coleus, which have multi-coloured leaves; and
- ficus and various palms.



## 2. **Medium light** - (250-650 foot-candles)

North, east or west (in winter) or shaded south windows are good. Venetian blinds, sheers, etc. are fine for shading. Any other spot that gets good daylight is suitable for these plants. Examples of moderate light lovers are:

- African violets, begonias, ivies and peperomia.

## 3. **Low light or shade** - (50-250 foot-candles)

A place out of windows and dark corners are fine for these plants. Examples of plants in this small category are:

- Chinese evergreen and cast-iron plant;
- ferns, which prefer some daylight;
- snake plant, which tolerates low light, but grows well in bright light too; and
- pothos, heart leaf philodendron.

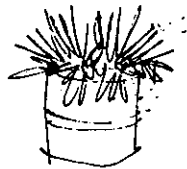
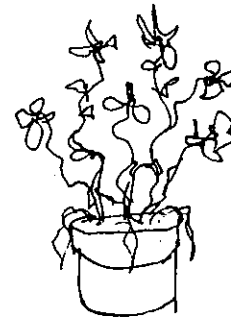
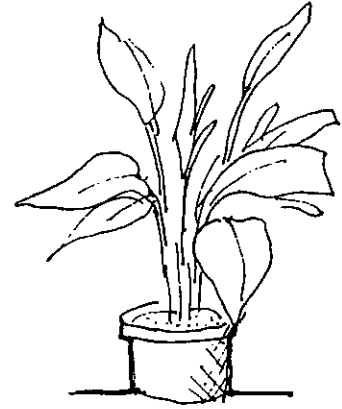
These plants need less water and fertilizer, because they are not growing as fast as those in brighter light. Over watering will result in root damage.

A plant that is not getting enough light becomes:

- pale green and weak looking;
- tall and leggy;
- less tolerant of warm air (its leaves may become brown at the tips); and
- non-flowering (in the case of flowering plants).

Too much light causes a plant to:

- become very compact; and
- leaves may curl or become scorched.



**TIP:** Plants grown in windows tend to grow towards the light. Turn them  $\frac{1}{4}$  turn often to keep them from becoming one-sided!

## USE OF ARTIFICIAL LIGHT

Artificial light is particularly useful in the winter when sunlight is not as strong. Lamps can act as a "bright, sunny window" in any spot in your home. Any source of extra light will improve the growth of plants in dim locations if 4-6 hours are supplied daily.

Special lights can be purchased. They are fluorescent lamps called such names as Gro-Lux, Plant Gro, etc. Place the lights 30-45 cm above the tops of the plants - the closer distance for bright light plants and the further distance for low light plants. These are ideal for African violets. Experimenting is the best way to find the correct distance for your plants.



## TEMPERATURE AND HUMIDITY

### TEMPERATURE

Most house plants are happy with a constant air temperature somewhere between 19-21°C in the day and 3-5°C lower at night. Cool temperature plants require a day temperature of 16-18°C and 3-5°C lower at night. There will be temperature differences in your house. Choose a cool area for a plant that prefers a cool spot and a warm area for one that likes a warm spot. Caution: In the winter, protect your plants from cold drafts around windows. Remove the plants from the area or use a blind or window caulking to prevent chilling. Plants also don't like to be too close to heat registers.

### HUMIDITY

Usually the humidity inside your house is low, especially in the winter. This is great for cacti and succulents, and most other plants can survive low humidity, but they do need a moister environment to thrive. This is not as serious a problem as it once was because most homes now have humidifiers on furnaces or portable humidifiers.

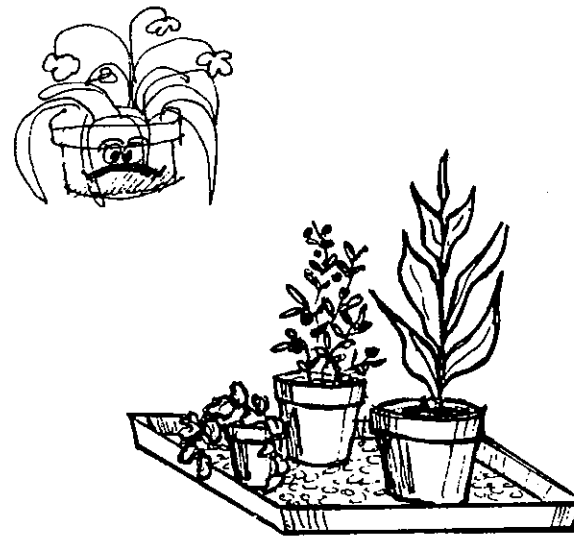
A plant suffering from too little humidity will:

- grow slowly; and
- have brown tipped and dull looking leaves.

Humidity can be increased easily by:

- setting the plants in the rooms where the air is moist, e.g. kitchen, sink areas, bathroom, laundry room, etc.;
- setting a shallow pan of gravel with water under the plants. The water should not touch the bottom of the pots; or
- grouping plants (being careful not to crowd them).

Adequate air movement is important for the prevention of plant disease. However, placing plants near cold and hot drafts can damage plants; so, don't place them near vents, furnace registers, windows or doors.



### PEST PROBLEMS

Indoor plants can be attacked by insects just as outdoor ones can. Spider mites are a particular problem, especially in the winter when the air indoors is dry. You can prevent some pest problems in the following ways.

1. For mites, wash the plants' leaves with mild detergent in lukewarm water or in the shower. Rinse well. Do this about once a month.

This leaf care also cleans dust and grease off the leaves, helping them breathe better.

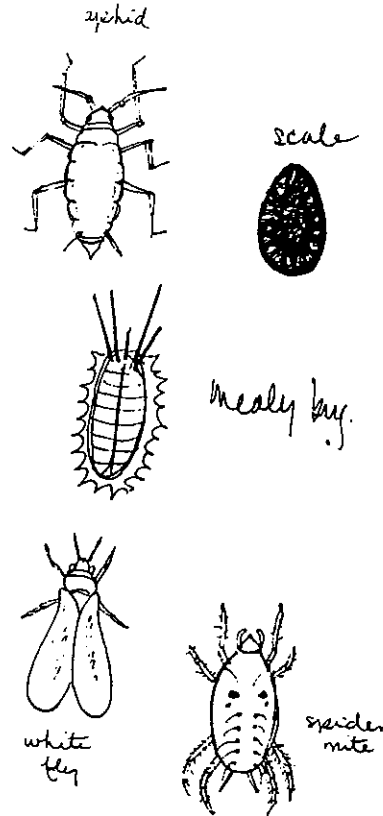
2. Isolate new plants and those brought indoors after the summer. Pests might be hitching a ride right to your other house plants! Wash and inspect these plants and keep them isolated from your other plants for 2-3 weeks.

Cut flowers brought indoors should be kept away from house plants for the same reason.

## SOME COMMON PESTS

### Leaf Pests

1. **Spider mites** - very serious pests which multiply rapidly. They are tiny, orange-coloured with two dark spots on the back. Look for fine webs on the leaves. They suck juices from the underside of leaves. Plants might be killed.
2. **Scales** - small, oval, flat and usually brown. They look like spots on the foliage and stems where they suck plant juices. They are commonly found on palms, philodendron and fern.
3. **Whiteflies** - small, white and mothlike. They feed on the underside of leaves. Plants may die. They produce large amounts of a honey dew liquid which promotes black, sooty mold. They are commonly found on poinsettia, geranium, fuchsia and gerbera.
4. **Mealy bugs** - small, oval and pinkish. They are found under bits of white fluff on the leaves and stems. They suck plant juices. They are commonly found on hoya, orchid plants and many other foliage plants.
5. **Aphids or plant lice** - small, pear-shaped and usually green. They are usually found in groups on new growth or the underside of leaves where they suck plant juices. They multiply very quickly.



Leaf insects cause the foliage to discolour and/or become curled or wilted.

### Soil Pests

Worms, insect grubs, springtails, fungus gnats and millipedes are some pests that are occasionally found in the soil. They are usually not as damaging as leaf pests. Springtails feed on decomposing organic matter and roots. Fungus gnat larvae often feed on roots when present in sufficient numbers.



### SOME PEST CONTROL TACTICS!

1. If there are not too many insects, wash the leaves in a mild detergent solution and then rinse.
2. Hand pick the insects, if only a few.
3. Destroy the plant if it is badly infested and badly damaged. You could burn the plant or throw it out, but make sure not to throw it into your composter! Destroying it could prevent spreading the insects to other healthy plants.
4. Some pests, e.g. mealybugs, can be controlled with rubbing alcohol. Apply it to the pest with a cotton-tipped swab.
5. For fungus gnats and white flies (delicate little flies), try "sticky sticks" (purchased from a garden centre). They are yellow sticky paper on sticks which you set in the pots of infested plants.
6. For spider mites, try liquified onion (ground up in a blender) and 1 tablespoon of Tabasco sauce. Strain the mixture and spray on the infested plant with an atomizer. Use once a week for 4 weeks. Showering weekly for four weeks will usually clean up a mite infestation.
7. For soil pests, remove the plant from its pot. Dispose of soil. Wash roots thoroughly and replant in clean soil and pot.
8. Use an indoor plant insecticide with adult supervision. Identify the pest. Read the label and follow exact instructions. Be sure that the insecticide you choose will kill the pest your plant has, but will not harm the plant. Do not spray in human living areas be sure to move plants to the garage and spray there.

**DISEASES**

Diseases occur under moist conditions. The air in homes is usually dry, but the soil is moist; and so it makes sense that disease attacks roots more often than leaves. Powdery mildew is a very common foliar disease of begonias. Avoid leaving plants in windows. Because of radiant heat loss, the leaves become cooler than the air temperature, with condensation of the moisture on the leaf surface causing mildew.

**PREVENTION OF DISEASES**

1. Use sterile containers. ie. Make sure containers are new or have been scrubbed with a mild bleach solution and rinsed before use.
2. Don't overwater plants. Plants will weaken and be more likely to suffer from disease. Check plant roots. Unhealthy roots will be greyish-black and often split.
3. Don't allow water to sit on the leaves or flowers.
4. Don't overcrowd the plants. They need fresh air moving around them.
5. Protect plants from great temperature changes and drafts.
6. Remove old flowers and faded leaves.
7. Carefully check new plants for disease problems before you bring them into your home. Don't assume that every plant for sale is a healthy one!

**CONTROL OF DISEASES**

A badly diseased plant, and especially one with a root rot problem usually won't get better, even if diseased parts are removed. If the plant is in really bad shape, chances are that no chemicals will provide effective control either. Usually, it's best to just throw out the plant. Some foliar diseases like powdery mildew can be controlled by application of a fungicide.

**BEFORE THE NEXT MEETING**

1. Home plant check! Examine the plants in your home. What problems do you find (e.g. too much water, too little light, air too dry, insects and/or disease)? How are you solving the problem(s)? It may be helpful to refer to the "Troubleshooting Indoor Plant Problems" chart on page 49.
2. Prepare for your field trip. Note your plans here. Make sure that your parents know about the field trip.

DATE: \_\_\_\_\_

TIME: \_\_\_\_\_

MEETING PLACE: \_\_\_\_\_

TRANSPORTATION ARRANGEMENTS: \_\_\_\_\_

\_\_\_\_\_

# The Greenhouse Grown



## ROLL CALL

Name a plant problem you found when doing your "home plant check". Tell how you solved the problem or are trying to solve it.

\*\*\*\*\*

Besides the basic needs discussed in "Pamper Your Plants", indoor plants need the proper size of containers and good potting soil. A plant may look unhealthy because the pot is too big or too small, or the soil too packed, etc. Let's take a look at pots and re-potting.

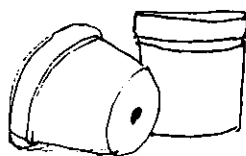
## CONTAINERS

There is a wide variety of containers available. You can choose the size, colour, shape and type for your needs. The list below mentions a few kinds you might find.

- **plastic** - the most common one today.
- **clay** - the best for plants. It allows more air in to the roots. Soil dries out faster though, and this pot should be soaked before use.
- **ceramic** - glazed pots are quite decorative.
- **glass**
- **fibreglass** → These three make the soil and roots too warm when in
- **metal** → direct sunlight. Zinc and copper pots can be poisonous to plants.

## WHAT TO LOOK FOR WHEN CHOOSING A CONTAINER

- A pot with drainage holes is a must. If there are no drainage holes, use only as an outside decorative pot.
- A self-watering pot is good for some plants. It is more expensive, but helps control the amount of water a plant gets. This pot has a wick through its drainage hole. No gravel is added. Soil is firmed into the pot so it touches the wick. The pot, with a plant, is set in a container of water and the wick draws the water up into the soil keeping it moist. There must always be water in the container. Note: These containers are not good for dry soil loving plants eg. cacti and succulents.
- New or well cleaned used pots. Scrub used pots with a mild bleach solution. Rinse well.



## SOIL MIXES

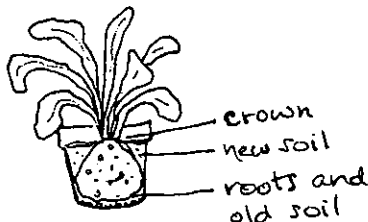
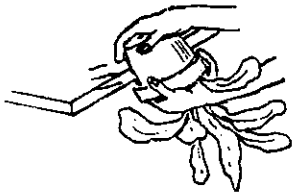
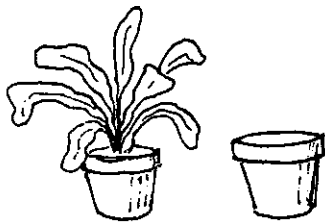
It is easiest just to buy a good potting soil at a garden centre. However, you may make your own mix as described in Meeting #2 under "Potting Techniques".

## REPOTTING

### WHEN IS REPOTTING NECESSARY?

1. **When a plant dries out faster than it did before and/or when roots are seen growing out of the drainage hole.** This happens when the plant and pot size are out of proportion. Such a plant is "pot bound". There will probably be little or no new growth.
2. **Most plants need to be repotted once a year.** Some slow growing kinds can be left longer. If you want to keep a large plant at a certain size, you can keep it pot bound. Instead of repotting, replace the top 10-15 cm of soil every 1-2 years.
3. **When the soil no longer holds enough nutrients to support good plant growth.** This happens when the plant has been growing in the same soil for a long time.
4. **When soil has a sour odour from overwatering and the plant looks unhealthy.**
5. **When soil stays moist after a week without watering.** The drainage holes may be plugged, the soil too compact (packed and decomposed) or the pot too large for the plant.

### REPOTTING TECHNIQUES



- Moisten the soil the day before.
- Choose the right size of container. The diameter of the new pot should be 2-3 cm larger than the old one (except in the case of #5 above - a smaller size of pot may be needed).
- Holding the pot in one hand, and straddling the top of the plant with the other, turn the pot upside down. Tap the pot against a hard surface so the plant and soil will slip out.
- Remove some of the old soil, particularly around the top of the rootball. If pot bound, pull roots apart to encourage rooting into the new media.
- Put a little new soil in the pot. Place the plant in the centre of the pot. The crown of the plant should be 1-2 cm below the rim of the pot.
- Gradually add new soil, firming it as you go. Fill so the crown is at the same depth in the soil as before.
- Water thoroughly. The 1-2 cm space at the top is to allow proper watering.

For this meeting, you and your club will be going on a field trip to a local greenhouse or florist shop, or perhaps both. Some greenhouses have florist shops too.

Keep in mind that these plants are grown and cared for by professionals. If your plants look as good as the ones you see on your visit, you have a knack for growing plants!

## GREENHOUSE AND FLORIST SHOP - WHAT TO SEE

Both greenhouses and florist shops are in the business of growing plants. This means that both of them grow and sell plants and, sometimes, plant products (eg. pots, plant food, crafts, etc.) to make a living. To sell these goods, they must be made appealing to customers. This can be done in different ways.

1. Advertising in local newspapers, in flyers, on the radio and on television. These are ways of letting people know about the things that they have for sale. They may also advertise special prices.
2. Displaying plants and plant products in an eye catching way eg. having a brightly coloured grouping of plants at the entrance.
3. Labelling all of their items in a pleasing way eg. brightly coloured tags with growing details.
4. Including delivery of plants as part of their service.

Take notice of the different jobs that there are at greenhouses and/or florist shops. Sometime you may be interested in having a part time or summer job, or maybe a career, in this type of horticulture.

Here is an outline of things you should notice on your trip.

### GREENHOUSE

This is where plants are grown. The growing conditions are made ideal for the plants. You should notice some of the things in the list below.

- A tropical feel and smell to the air, since the humidity is higher than in your home.
- Good lighting. The greenhouses are either glass or double polyethylene. There may be some shading material, if the sunlight is very strong (as it is in late spring and summer).
- A temperature change from house to house to suit the needs of different plants, e.g. cacti in a warmer one than chrysanthemums.
- Watering systems. Automatic ones may be used for some plants, plus automatic water-soluble fertilizer in the same solution.
- Pots are different sizes to fit the different sized plants.
- Potting soil mixtures. They are different for some plants, e.g. cacti have a special mix. You may see some potting being done.
- Plants propagated in different ways, e.g. cuttings, grafted cacti (where an ornamental cactus is grown on another cactus), etc.

### FLORIST SHOP

This is where the plants are sold. The plants and the shop must look attractive so that people want to come in and buy the plants. You should notice some of the things on the list below.

- A tropical feel and smell to the air.
- Good lighting.
- A wide variety of plants cared for mainly in one room. Plants are here for a short time so they don't have to have the ideal conditions they would get at the greenhouse.
- Plants will vary according to the season, e.g. at Christmas, poinsettias are common and at Easter, Easter lilies are for sale.
- Cut flowers and arrangements. These are kept in a cooler.
- There may be other items, such as crafts, fancy containers, etc. for sale.

## FIELD TRIP RECORD OF GREENHOUSE GROWN PLANTS

Record the information about your visit on this sheet.

Date of visit: \_\_\_\_\_

Name of business: \_\_\_\_\_

Type of business:     greenhouse             greenhouse and florist shop  
                           florist shop             other (what?) \_\_\_\_\_

Types of plants found here:

<input type="checkbox"/> foliage	<input type="checkbox"/> cut flowers and arrangements
<input type="checkbox"/> flowering and fruiting	<input type="checkbox"/> annuals and perennials for outdoors
<input type="checkbox"/> cacti and succulents	<input type="checkbox"/> herbs
<input type="checkbox"/> flowering bulbs	<input type="checkbox"/> other (what?) _____

Are there any special plant gardens?

dish gardens             mixed pans             hanging baskets  
 terrariums                     other (what?) \_\_\_\_\_

Are there any special occasion flowers/plants?     Yes             No

If yes, what are they? \_\_\_\_\_

### Senior Members

How does a grower manage to have so many plants of one kind blooming for a particular special occasion?

e.g. Poinsettia at Christmas \_\_\_\_\_

\_\_\_\_\_

What jobs have you learned about on your visit (answer only for where you visited)?

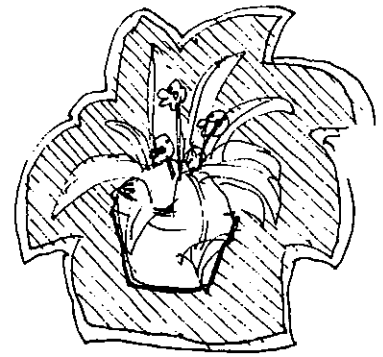
at a greenhouse \_\_\_\_\_

\_\_\_\_\_

at a florist shop \_\_\_\_\_

\_\_\_\_\_

# Floral Facts and Fun



## ROLL CALL

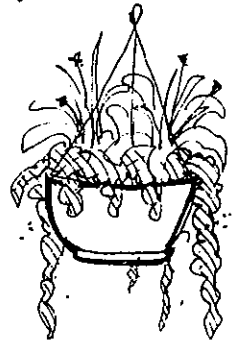
Show your sketch or picture of an interesting way to use indoor plants. Briefly explain its use.

\*\*\*\*\*

Plants are grown in the home for many reasons. While the most common one is to beautify the home, some plants are grown for their smell or edible uses. Others act as air purifiers.

## SPECIAL USES OF INDOOR PLANTS

The main reason for growing indoor plants is because they are attractive. However, some house plants have special or unusual uses, which make them interesting to grow.



Plants	Uses
1. Zebrina, spider plant, ferns and ivies	- Are examples of plants which are good in hanging baskets
2. Oleander (O-lee-an-der) and scented geraniums	- Are examples of plants grown for their very fragrant flowers and foliage (in that order).
3. Orange tree	- This plant has small very sour fruit, which is good for marmalade.
4. Parsley, chives, mint and rosemary	- Are examples of herbs grown indoors for their use as seasonings or flavourings
5. Orchids and bromeliads (pronounced OR-kids and bro-MEAL-e-ads)	- Are unusual and exotic flowering and foliage plants. They need special treatment for good growth.
6. Aloe	- The sap may be used in creams or directly from the leaf to relieve pain from a burn.
7. Myrtle and natal plum	- Are good for bonsai because they are easy to train.



**BEFORE THE NEXT MEETING**

1. Report on your field trip:
  - a) If you had a job at a greenhouse or florist shop, what would you like to do?  
\_\_\_\_\_  
\_\_\_\_\_
  - b) Why does this job appeal to you? \_\_\_\_\_  
\_\_\_\_\_
  - c) What growing tips did you learn? \_\_\_\_\_  
\_\_\_\_\_
  
2. Check some plants at your home (or a friend's) to see if they need to be repotted. If so, why? \_\_\_\_\_  
\_\_\_\_\_
  
3. For the next roll call, find an interesting way to use indoor plants. You could sketch an idea you saw on your field trip or cut out a picture in a magazine and bring it to the meeting.



## POISONOUS PLANTS

Some indoor plants are pretty and useful but are also poisonous. You should be aware of these plants and their poisonous parts, especially if young children are around. Pets may suffer from plant poisoning too.

These plants may cause allergic reactions, skin rashes and/or poisoning when eaten. Some people react more violently to the poisons than others.

**Allergic reactions** - only affect some people. Plants may vary.

**Skin rashes** - the sap of some plants contains an irritant, e.g. Crown-of-thorns, milk bush and oleander.

**Poisonous when eaten** - certain plant parts or even the entire plant may be poisonous. Here are some common ones:



- Oleander (green or dry parts)
- Jerusalem cherry, especially unripe → fruit and leaves

**both could cause death**



Other dangerous plants are azalea, caladium, dumb cane, elephant's ear (Calocasia), flamingo flower (Anthurium) and sedum.

- leaves only - English ivy, dracaena
- leaves and buds - hydrangea
- leaves and stem - calla lily (which has an underground stem called a rhizome) and philodendron
- seeds - castor bean - 1-3 seeds could kill a child. The leaves are less poisonous.
  - bird-of-paradise - the capsule containing the seeds is poisonous too.
- green berries only - lantana
- sap - crown-of-thorns and milk bush (both are Euphorbia)
- bulbs - daffodil and narcissus - may cause death
  - cyclamen, hyacinth and tulip.



## PLANTS AS AIR PURIFIERS

Some plants have been proven to break down harmful chemicals and use them as food. Then they put fresh oxygen back into the air for us to breathe. Three pollutants tested by the US National Aeronautics and Space Administration (NASA) have big names - benzene (pronounced BEN-zeen), formaldehyde (for-MAL-de-hide) and trichloroethylene (try-CLORO-ethel-een). These pollutants come into our homes in small amounts in such things as cleaning products, paints, inks, paper towels, furniture glues, etc.

Plants which have been proven as air purifiers are:

- Chinese evergreen
- chrysanthemum
- pothos
- spider plant
- three types of Dracena: "Warnecki", "Janet Craig" and "Marginata".

Not only are these plants helpful to have in your home, but offices, schools, etc. should find them beneficial as well.

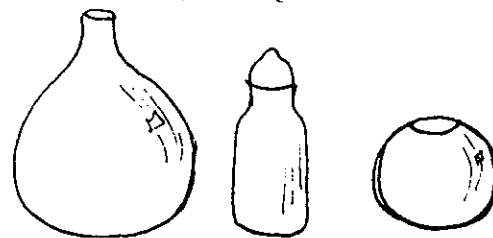
## SPECIAL GARDENS

Special gardens are a mix of plants with similar needs in one container. Check the list of "Care and Maintenance of Some Easy-to-grow Indoor Plants" in the appendix on page 51, for some plants with similar needs. Four types are:

1. **Terrarium** - a mini covered garden in a glass or plastic container. Tropical plants are used.
2. **Desert garden** - like a terrarium but with no cover. Cacti and succulents are used.
3. **Tropical dish garden** - a low dish of plants like you would use in a terrarium.
4. **Bottle gardens** - similar to terrariums but in narrow-necked containers. Long handled equipment is used. These are trickier to build than terrariums.



Tropical Dish Garden



Bottle garden containers

These gardens can be fun to build. We will look at terrariums and desert gardens in detail.

### 1. **Terrariums** (ter-AIR-ee-um)

A container should:

1. Be clear or tinted glass or plastic, e.g. fish tank, brandy snifter or casserole dish; (Wide necked containers are the easiest to plant.)
2. Have a loose-fitting lid or sheet of plastic or glass to cover the top; and
3. Be new or scrubbed and sterilized.

### Plants for Terrariums

Most house plants, except cacti and other succulents, are fine for terrariums. The best choices are plants which love moisture and don't grow too big. Make sure that you choose plants that have the same light, temperature and water needs.

Some ideal plants for terrariums are listed below.

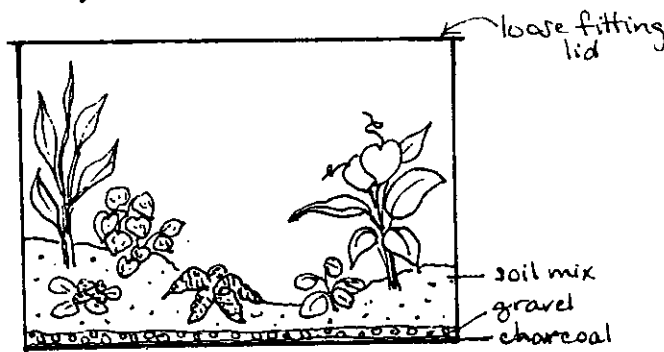
- Baby's tears (Helxine)
- Dwarf African violet (Saintpaulia)
- Miniature gloxinia (Sinningia) → prefer warm temperature
- Mosaic plant (Fittonia)
- Peperomia (Peperomia) (many kinds)
- Aluminum Plant (Pilea) (and other pileas)
- Peacock plant (Calathea) → prefer warm, but tolerate cool temperatures
- Prayer plant (Maranta)
- English ivy (Hedera) (small leaved kinds) → prefer cool temperatures
- Venus fly-trap (Dionaea)

All of these plants are of small or medium height. They grow well in medium light and like high humidity and moist soil.

For a woodland terrarium, you might choose mosses, lichens, or small ferns. You could collect these in a local forest if you get permission first. Add small stones, pine cones and bits of wood to create a natural effect.

### Planting

- If you can and you want to, spread a handful of crushed charcoal over the bottom to keep the soil fresh. (This isn't necessary.)
- Line the container with 2 ½ cm of gravel or pebbles for drainage.
- Add a 5 cm layer of moist potting mix - the same mix as for potted plants: 1 part purchased soil to 1 part peat moss or organic matter to 1 part sand (1:1:1).
- If the container is large, you could make a mini landscape with hills and valleys.
- Arrange plants so that there is a variation in leaf colour, texture, size and shape. Make sure that the taller plants don't block the smaller ones.
- Don't crowd the plants.
- Dig small holes and set the plants in them. Firm the soil around the roots. Don't allow plants to touch the sides of the container. Their leaves will turn brown.
- Water lightly, if necessary.

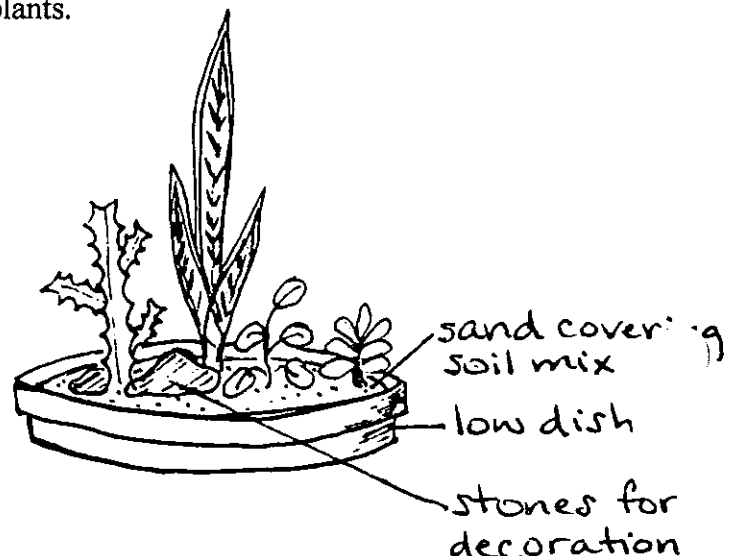


### Maintenance of Your Terrarium

- Place your newly planted terrarium in a shaded area until the plants are well established (approximately one week). Then place it in a well-lit area, but not in direct sun.
- Watering is not usually necessary because the plants recycle the water they use.
- Don't fertilize, because slow growth is best in the small growing space they have.
- You might need to prune some faster growing plants.
- Remove damaged and dead leaves.

## 2. **Desert Gardens**

- Use a low, shallow dish or a glass container (such as a fish tank with no cover).
- Choose a mix of at least three cacti and succulents. Sedums and Kalanchoe become leggy, so avoid them.



## Planting

- Put at least a 2 ½ cm layer of gravel in the bottom of the container for drainage.
- Add potting mixture for cacti [a mix of 1 part potting soil to 1 part peat moss to 2 parts sand (1:1:2)], layered with sand to the depth you need.
- Plant in the same way as for terrariums. When using spiny plants, use tongs or gloves to protect your hands.
- On the top, put a layer of sand or fine gravel (natural or coloured gravel from a pet store). The gravel helps keep the stems from becoming wet and rotting.
- To give the natural effect of mountains and boulders, you can place a few stones amongst the plants. Mexican figurines, huts and burros can be added for a very decorative effect.
- Give each plant 1-2 tablespoons of water after planting. Afterwards, water about once a month.

**TIP:** If you are using a large container, you can sink plants in clay pots in the soil mix. This prevents the chance of root damage.

## APPENDIX

Here are some OMAFRA publications that might be available from your local OMAFRA office.

### OMAFRA Factsheets

- #610 Herb Gardening
- #93-101 Flowering Annuals for the Home Garden
- #93-103 Rock Gardens

### Other Reference Books

1. The Colour Dictionary of Flowers and Plants for Home and Garden.  
Roy Hay and Patrick M. Syngé.  
Good photographs of indoor and outdoor plants.
2. The Gold Plated House Plant Expert.  
D.G. Hessayon.
3. Ortho's Complete Guide to Successful House Plants.
4. Simon and Schuster's Guide to House Plants.
5. The Total Book of Houseplants.  
Russel C. Mett.

### Web Sites to Check Out

Gardenbooks, Gardening and Horticultural Information  
<http://www.gardenbooks.com>

Illinois Co-operative Extension Series  
<http://www.ag.uiuc.edu/~robsond/solutions/horticulture/flowers.html>

Ontario Ministry of Agriculture, Food and Rural Affairs  
<http://www.gov.on.ca/OMAFRA/index.html>

## CARE AND MAINTENANCE OF SOME EASY-TO-GROW INDOOR PLANTS

<b>Plant Names</b>	<b>Mature Size/Use</b>	<b>Light Needs</b>	<b>Soil Needs</b>	<b>Air Temp. Needs</b>
African Violet (Saintpaulia)	table plant	medium (no direct sun)	moist	warm
Cast-iron Plant (Aspidistra)	table/floor	low-medium (no direct sun)	moist (tolerates dry)	cool to warm
Chinese Evergreen, Pewter Plant, etc. (Aglaonema)	table/floor	low-medium (no direct sun)	moist	warm
Coleus (Coleus)	table	high	moist	cool
Corn and Ribbon Plants, etc. (Dracena)	table/floor	medium	moist - let dry - between waterings	warm
Devil's Ivy (Pothos, also Rhapsidophora)	table	medium	moist (tolerates drying out)	warm
Dumb Cane (Dieffenbachia)	table/floor	medium	moist (tolerates drying out)	warm
Grape Ivy (Cissus)	table	low-medium	moist	cool to warm
Jade Plant (Crassula)	table/floor	high	dry	cool (tolerates warm)
Palms	floor	medium-high	dry during winter	warm
Pepper Face (Peperomia)	table	medium	moist	warm
Philodendron (Philodendron)	table/floor	medium-high (tolerates low)	moist	warm
Snake Plant (Sansevieria)	table/floor	low-high	dry	warm (tolerates cool)
Spider Plant (Chlorophytum)	table	medium-high	moist	cool
Umbrella Tree (Schefflera, also Brassia)	table/floor	high	moist	warm (tolerates cool)





Plants have few flowers, too many large succulent leaves	Too much nitrogen (N); insufficient light.
Bud drop	Too hot or cold when they were developing; shock from drafts or moving from greenhouse to home; low humidity; too low light levels.
Mushy, dark stems; rotting	Too much water, especially cold water; poor drainage; poor air flow. Disease attack encouraged by damp and cold.
White crust on soil	Build up of salts from fertilizer or bicarbonates from hard water.