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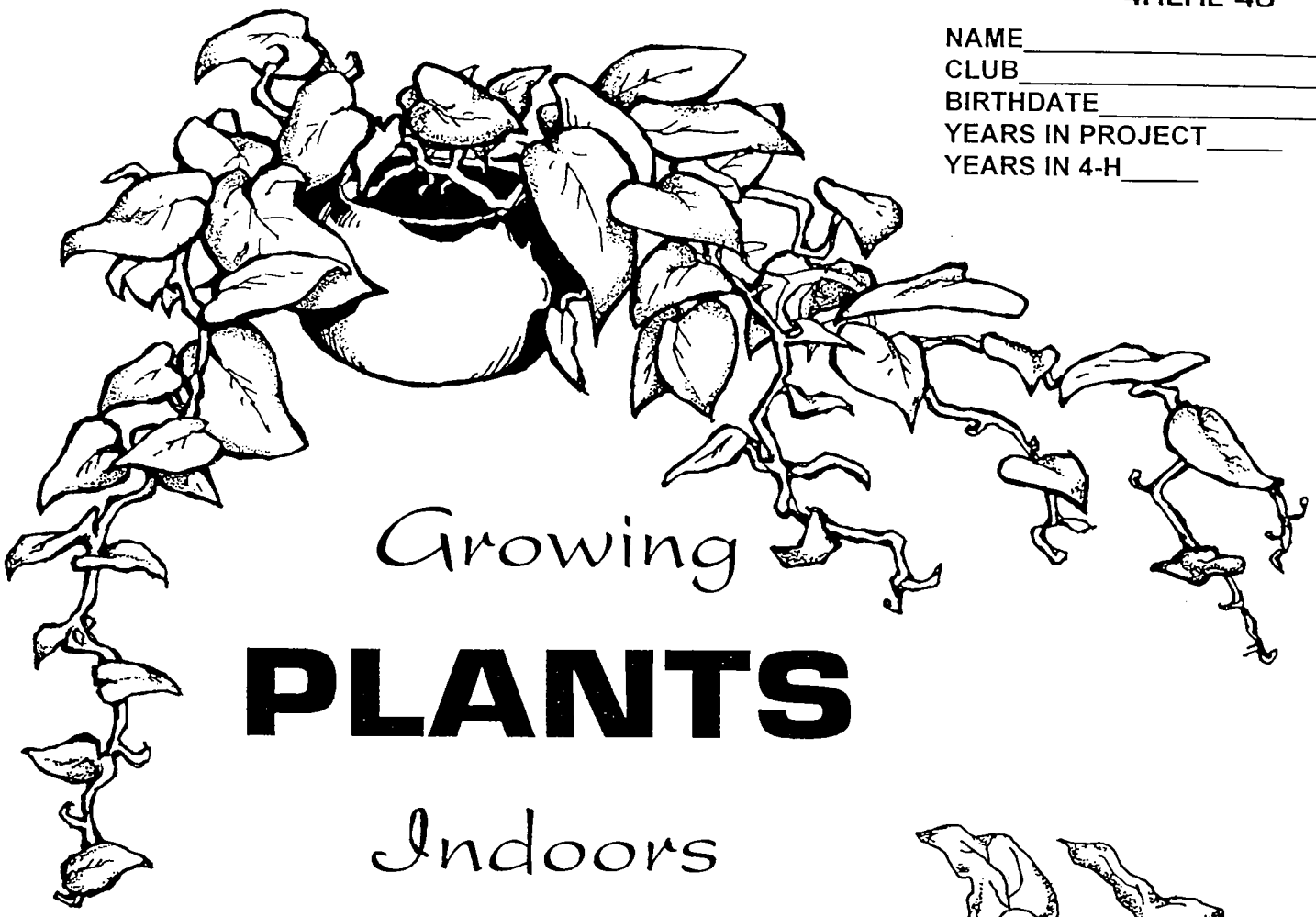
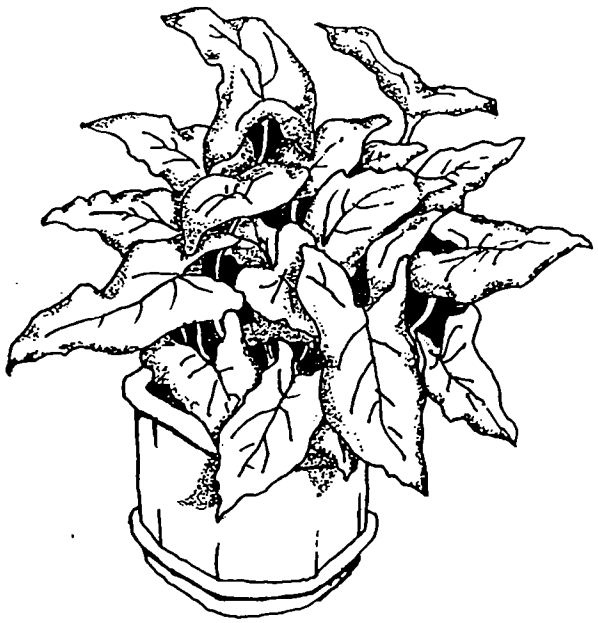


Growing PLANTS Indoors

4-H Indoor Gardening Project



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GROWING PLANTS INDOORS:

4-H Indoor Gardening Project

INTRODUCTION

You are about to begin a project that is useful and fun: Indoor Gardening. The skills you develop from this project will be useful throughout your life.

This project is designed to help you:

- Identify common plants that can be grown indoors.
- Learn proper care of plants indoors.
- Learn common plant problems.
- Share your new knowledge with others.

This project may be taken for several years by completing 2 different activities each year and learning 5 more plants each additional year.

This project requires that you:

1. Learn to identify 5 plants commonly grown indoors.
2. Grow at least 3 plants in your home.
3. Complete 2 of the suggested activities.
4. Give a demonstration related to this project and/or exhibit your plants at a fair or flower show.
5. Keep a project record book.
6. Visit a florist, nursery or garden center that sells plants that can be grown indoors.

Growing plants indoors has always been a popular hobby. They can make a home, office or other buildings more cheerful and pleasant. Some plants are grown indoors because of their colorful flowers. Others either rarely flower indoors or their flowers are not showy but they are grown indoors primarily for their attractive leaves.

Plants commonly grown indoors are often referred to as "houseplants." However, there is no such thing as a house plant (a plant intended to grow inside a house). In fact, when plants are brought indoors, they have to adjust to a difficult environment. Usually, lack of sufficient light and low humidity impose the most severe restrictions on growth, but temperature may sometimes be a problem.

You can buy plants that tolerate indoor growing conditions at supermarkets, department stores, flower shops or nurseries, or you can start your own by rooting cuttings from plants already in your home. However you obtain them, you have to provide your plants with tender loving care.

Care of Plants Indoors

Light

One of the most important factors for growing good plants indoors is adequate light. Plants need light to make food for growth and if they do not receive enough light they become weak and spindly. Plants differ in their light requirements. Those with highly colored leaves, such as coleus and croton, flowering plants, and succulents grow best in full sunlight. Ferns, philodendrons and many other foliage plants grow best with indirect light.

Plants always turn their foliage and flowers toward the light. So plants receiving light from one side should be given a half turn once a week to keep their shape well balanced. The light requirements for many foliage plants commonly grown indoors are given in Table 1.

Table 1. Light Requirements for Some Common Foliage Plants

Foliage Plants for Low Light Areas 50 to 100 foot candles[1] (location usually more than 6 feet from windows, no indirect light-dull hallways)	
Common Name	Botanical Name
Bamboo palm	*Chamaedorea erumpens*
Birdsnest sansevieria	*Sansevieria trifasciata 'Hahnii'*
Cast-iron plant	*Aspidistra elatior*
Chinese aglaonema	*Aglaonema modestum*
Corn plant	*Dracaena fragrans 'Massangeana'*
Janet Craig dracaena	*Dracaena deremensis 'Janet Craig'*
Parlor palm	*Chamaedorea elegans*
Pewter aglaonema	*Aglaonema crispum*
Silver aglaonema	*Aglaonema commutatum elegans*
Snake plant	*Sanseviera trisfasciata*
Tricolor blushing bromeliad	*Neoregelia carolinae 'Tricolor'*
Warneckii dracaena	*Dracaena deremensis 'Warneckii'*

Foliage Plants for Medium Light Areas 100 to 200 foot candles (location usually 3 to 6 feet from windows, well lighted areas)	
Common Name	Botanical Name
Aluminum plant	*Pilea cadierei*
Areca palm	*Chrysalidocarpus lutescens*
Asparagus fern	*Asparagus densiflorus* 'Sprengeri'
Boston fern	*Nephrolepis exaltata*
Chinese fan palm	*Livistona chinensis*
Cleveland spathiphyllum	*Spathiphyllum* x 'Clevelandii'
Clusea	*Clusea rosa*
Cuban laurel Fig	*Ficus benjamina nitida*
Cut-leaf philodendron	*Monstera deliciosa*
Emerald Gem Nephthytis	*Syngonium podophyllum* 'Emerald Gem'
English ivy	*Hedera helix*
Episcia	*Episcia cupreata*

Common Name	Botanical Name
Exotic Perfection Dumbcane	*Dieffenbachia* x 'Exotic Perfection'
False Aralia	*Dizygotheca elegantissima*
Fern asparagus	*Asparagus setaceus*
Fiddle-leaf fig	*Ficus lyrata*
Fiddle-leaf philodendron	*Philodendron bipennifolium*
Fishtail palm	*Caryota mitis*
Golden pothos	*Epipremnum aureum*
Gold dust plant	*Dracaena surculosa*
Giant dumbcane	*Dieffenbachia amoena*
Grape ivy	*Cissus rhombifolia*
Green Gold Nephthytis	*Syngonium podophyllum* 'Green Gold'
Heart-leaf philodendron	*Philodendron scandens oxycardium*
Jade Plant	*Crassula argentea*
Lance dracaena	*Dracaena thalioides*
Marble queen pothos	*Epipremnum aureum* 'Marble Queen'
Prayer plant	*Maranta leuconeura* 'Kerchoviana'
Oval-leaf peperomia	*Peperomia obtusifolia*
Peacock plant	*Calathea makoyana*
Philodendron	*Philodendron hastatum*
Pigmy date palm	*Phoenix roebelenii*
Red-edge dracaena	*Dracaena marginata*
Rex begonia	*Begonia x rex cultorum*
Rubber plant	*Ficus elastica* 'Decora'
Sander's dracaena	*Dracaena sanderana*
Schefflera	*Brassaia actinophylla*
Screw pine, Sword plant	*Pandanus veitchii*
Staghorn fern	*Platycerium bifurcatum*
Victoria table fern	*Pteris ensiformis* 'Victoriae'
Wax plant	*Hoya carnosa*
Weeping fig	*Ficus benjamina*

Foliage Plants for High Light Areas
Over 200 foot candles
(location usually brightly lighted offices-
areas within 3 feet of large south, east or
west facing windows)

Common Name	Botanical Name
Calamondin orange	*Citrofortunella mitis*
Coffee	*Coffea arabica*
Croton	*Codiaeum variegatum*
Norfolk-Island pine	*Araucaria heterophylla*
Pencil cactus	*Opuntia ramosissima*
Pony tail palm	*Beaucarnea recurvata*
Ti plant	*Cordyline terminalis*
Velvet-leaf philodendron	*Philodendron scandens* subp. scandens
Zebra plant	*Aphelandra squarrosa*

[1] Foot candles - a measure of light usually determined with an instrument called a light meter. One foot candle is the amount of light falling on one square foot of surface located one foot away from a candle.

Potting Mixes

Foliage plants do best in potting mixtures containing high levels of organic matter such as peat (Figure 1). The following mixes are suggested for growing plants:

1. 2 parts peat, 1 part perlite, 1 part coarse sand
2. 2 parts peat, 1 part coarse sand
3. 1 part peat, 1 part coarse sand, 1 part pine bark
4. 1 part peat, 1 part pine bark, 1 part perlite

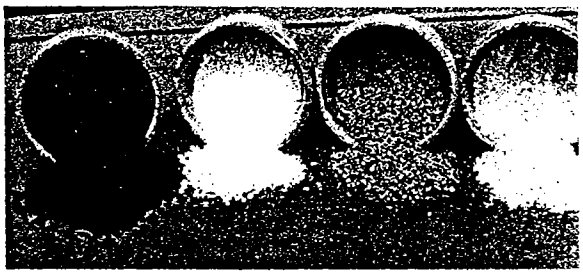

Figure 1. Materials often used in potting mixtures (from left to right), peat, perlite, vermiculite and sand.

Cacti and other succulents do best in mixes which contain coarse sand. A good mix for succulents is 2 parts soil, 1 part peat, 1 part perlite, and 1 part coarse sand.

Generally, soil obtained from the yard (native soil) is not ideal for container grown plants. This soil needs to be improved with peat, bark, perlite or sand to improve its ability to hold water and nutrients. To kill harmful fungi and bacteria, insects and weed seed, spread moist soil in a tray or pan and bake at 200°F for 20 minutes, stirring every 5 minutes.

Packaged potting mixes can be bought at local nurseries and garden supply dealers. These materials are

convenient and often have been sterilized to kill disease organisms and weed seed.

Containers

Containers used for growing plants are made from clay, glazed clay (ceramic), plastic, metal or wood (Figure 2). Clay pots are porous and allow water to evaporate through the side and, therefore, require more frequent watering than glazed clay, plastic, metal or wooden pots. For that reason, most beginners, who have a tendency to over water, are usually more successful with clay pots.

Figure 2. Plants are grown in many kinds of containers:(left to right) glazed clay (ceramic), plastic, clay, metal and wood.

The size of the container depends on plant size and where it will be placed at home. Containers too large or too small present an awkward appearance. The container must be large enough to provide space for root growth for at least one year.

Temperature

Most plants grow best when day temperatures are of 65 to 75°F (18 to 24°C) and 60 to 65°F (16 to 18°C) at night. A sudden change in temperature can injure plants. Temperatures below 50° (10°C) may cause some plants to wilt and drop their leaves. Do not place your plants in very hot or cold spots such as near heating or cooling vents, on top of television sets, or near doors in winter.

Humidity

The air in the home is usually too dry for growing plants. Most homes have a humidity below 40 percent. Plants grow best at a relative humidity of 40 to 60 percent. You can help increase humidity by setting plants in a tray with 2 or 3 inches of wet gravel (Figure 3). Water evaporating from the tray increases the humidity around plants. Keep the water about 1/2 inch below the top of the gravel so the bottom of the plant pot is not sitting in water, because this will cause waterlogged soil, which may result in root damage.

Figure 3. Humidity around a plant can be increased by placing the plant on a bed of wet gravel.

Watering

One common cause of plant death is improper watering. When plants are overwatered, the soil remains saturated and root systems are unable to function properly because of lack of oxygen.

Plants should be watered when the potting mixture becomes dry to the touch. Stick your finger into the mix up to the first joints; if it is dry at the finger tip, you need to water (Figure 4).

Plants growing in clay pots that allow water loss through the sides of the pot will need to be watered more often than those growing in nonporous glazed or plastic

Figure 4. Water plants when the potting mixture feels dry to the touch.

pots. Also, plants in small pots will need water more often than those in large pots.

When watering, water thoroughly by applying enough lukewarm (room temperature) water until a small amount runs out of the bottom of the pot. Saucers or pans with catch water should be emptied within 20 to 30 minutes.

Containers without drainage holes should have a layer of coarse gravel placed in the bottom to allow a space for excess water (Figure 5). Another method of using containers without drainage is the "double-potting" technique (Figure 6).

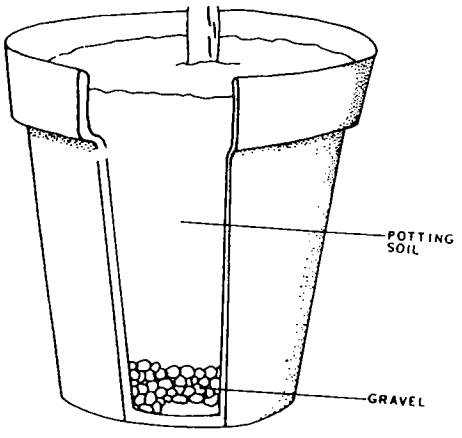

Figure 5. Place a layer of gravel in the bottom of the container without drainage holes to allow space for excess water.

Pot the plant in a container that has a drainage hole and is one inch less in diameter and shorter than the container without drainage. Place several inches of gravel in the bottom of the outer pot and place the potted plant on the gravel layer.

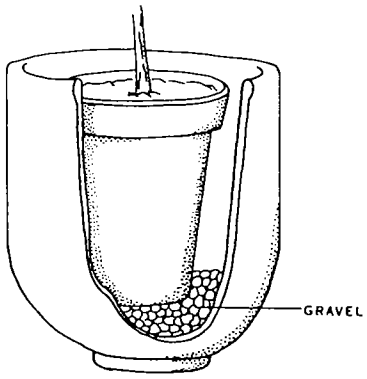

Figure 6. Double-potting technique. Plant in pot with a drainage hole is placed on gravel in a decorative container without drainage.

Fertilizer

Many problems with growing plants indoors are often blamed on insufficient fertilizer. However, poor growth is often a result of some other reason, such as poor light.

Most indoor plants grow slower than plants grown outdoors or in a greenhouse. As a result, indoor plants do not need as much fertilizer as outdoor or greenhouse plants. Also, rapid new growth is often undesirable as plants may outgrow their locations.

Interior plants under active growing conditions should be fertilized every 2 or 3 months. During winter months, or under low light, the plants should not be fertilized as often.

Many fertilizers are available for indoor plants and can be purchased in a variety of forms: water soluble powders and

pellets, liquids, tablets, sticks and time-release pellets. The liquid and water soluble powders and pellets are diluted in water as directed on the package label and poured on the potting mixture. The tablets, sticks, and time release pellets are placed on or in the potting mixture and are designed to release nutrients gradually and evenly over a long period of time. A small amount of nutrients are released from these fertilizers at each watering. Although some of these fertilizers are more convenient to use than others, all are effective if used as directed.

Grooming

The foliage of most plants grown indoors tend to collect dust and should be cleaned monthly. Plants with hairy leaves, such as African violets and gloxinias should not be wet, while the foliage of most others may be cleaned with a moist soft cloth (Figure 7). Clean foliage is favorable for healthy growth, and it keeps plants looking attractive. Frequent cleaning helps control insect and mite problems.

Figure 7. Foliage of most plants can be cleaned with a moist, soft cloth.

Plants should be checked periodically and dead leaves and flowers removed. Some plants require periodic pruning to keep them attractively shaped and at a size that makes them pleasant to have around.

Repotting plants

As the foliage of a plant grows, the root system gets larger, eventually filling the container and the plant becomes "pot-bound." When this happens, plant growth is restricted until repotting provides more room.

Fast-growing plants need repotting every year. Repot slow-growing plants every 2 or 3 years.

Water the plant to be repotted and allow it to set for several hours. Place your hand on the potting mix so the base of the plant is between the index and middle finger, then invert the pot. Next, tap the rim of the pot on the edge of a table until the root ball slides out of pot into your hand. Pull matted roots apart and cut away entangled roots. Select a pot which is slightly larger than the pot in which the plant was growing. Place a small piece of broken clay pot or gravel over the drainage hole and cover the bottom of the pot with enough potting mix to bring the top of the root ball within one inch of the pot rim. Place potting mix around the soil ball and firm gently. Water thoroughly immediately after repotting (Figures 8A - 8F).

Figure 8-A. With base of plant between index and middle finger, tap rim of pot on edge of a table until the root ball slides out of pot.

Figure 8-B. Pull matted roots apart and cut away entangled roots.

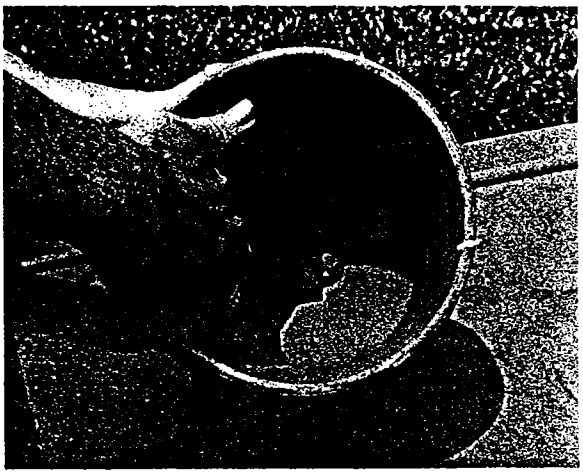

Figure 8-C. Place a small piece of broken clay pot or gravel over the drainage hole.

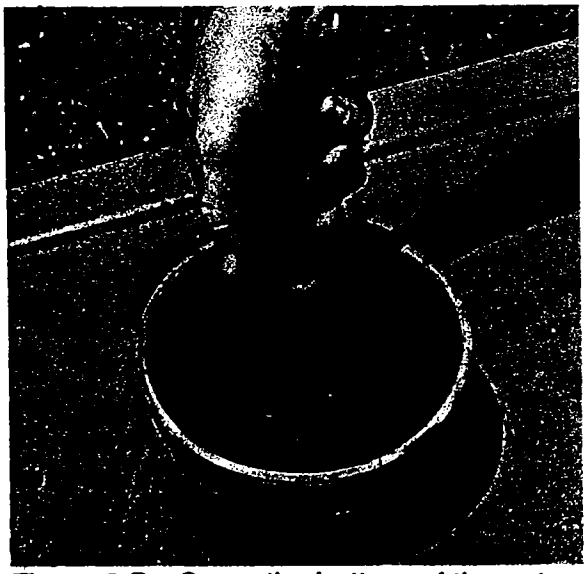

Figure 8-D. Cover the bottom of the pot with enough potting mix to bring the top of the root ball within one inch of the pot rim.

Figure 8-E. Place potting mix around the soil ball and firm gently.

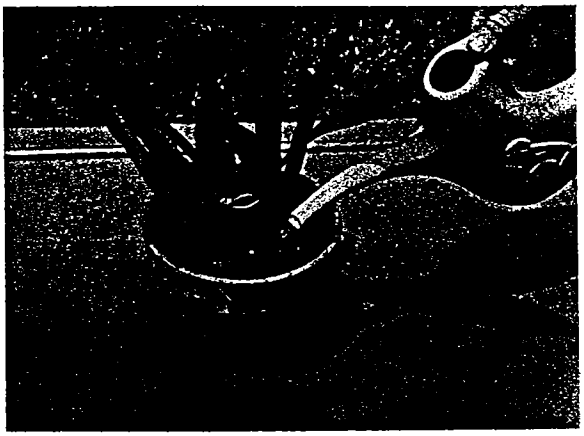

Figure 8-F. Water thoroughly immediately after repotting.

Problems

Cultural

Improper care may result in unattractive plants. Some of the common symptoms and conditions which may cause this are:

1. Brown leaf tips or margins... may be caused by too much fertilizer, lack of water or excessive fluoride found in irrigation water, potting media or fertilizers.
2. Leaf yellowing and dropping... are caused by air pollution, low light intensity, chilling, lack of water, over watering, or poor water drainage.
3. Slow growth or light green or yellow foliage... is caused by too much light, lack of fertilizer, root rot or poor root system.
4. Small leaves and spindly growth... are caused by too little light.
5. Small leaves and stunted growth... may be caused by lack of fertilizer or lack of water.
6. Small new leaves and leaves curled under... may be caused by too much light.

Insects

Common insect pests that harm house plants are (Figure 9):

Mealy bugs - Soft-bodied insects covered with a white cottony material. They damage plants by sucking juices from the plant.

Aphids - Very small green, pink, black, yellow or blue insects. Aphids suck plant juices and cause new growth to curl and become distorted.

Scales - Circular, oval, oblong or pear-shaped insects with a waxy covering. Scales can be found on leaves, twigs, and branches. They cause damage by sucking plant juices.

Spider mites - Greenish, yellowish, reddish or colorless pests. Mites are 1/50 inch long and damage plants by sucking their juices. Heavily infested plants are covered by a fine webbing.

Whitefly - Adults 1/16 inch long, white and resemble a tiny moth. Nymphs (immature stage) are 1/16 inch in length, pale green and flat and oval in shape. They are found on the underside of leaves and cause damage by sucking plant juices.

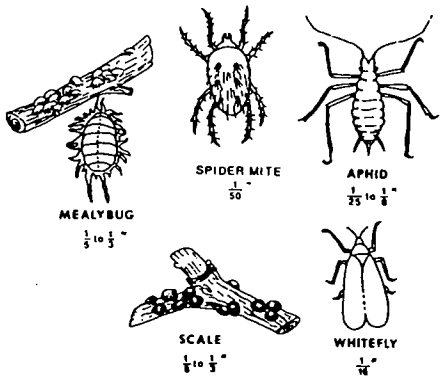

Figure 9. Pests of plants grown indoors.

Controlling Insects

Carefully examine all plants you buy to be sure they are free of pests. New plants should be kept away from other plants for at least a month.

Spraying plants with a forceful stream of room-temperature water every 2 weeks will remove many insects before they have a chance to become a problem. Spray the underside of the leaves where most pests are found. This procedure is best done outdoors or in a sink.

Diseases

Plants grown indoors have few diseases. Most problems are caused by poor growing conditions. Rotting of roots and stems of plants can usually be traced to over watering.

Showing Your Plants

Showing your plants at a flower show can be a wonderful experience. Almost any show will welcome your exhibit. Some pointers for preparing your plant for the show are:

1. Clean the container.
2. Remove all dead or yellow leaves.
3. Cut back unsightly, leggy stems.
4. Wash the leaves with a soapy solution made with 2 teaspoons of mild liquid detergent and one gallon of warm water.
5. Turn pots each day so that the plants will have a pleasant, natural form. If unturned, plants will bend towards the light.
6. Avoid placing special materials on leaves to give them a glossy, artificial appearance.
7. Never repot a plant within 2 months of a show. The plant may lose some of its luster and show transplanting stress.
8. Never use artificial flowers, animals or other objects with your display. The plant should be the dominant feature. Use totem poles or other supporters that will not detract from the plant.
9. Show your plant in a neutral-colored container that is not too large or too small for your plant.
10. If possible, allow enough room for displaying the plant. If other plants are too close, it will not show up as well.

Activity I - Making a Terrarium

A terrarium is a collection of small plants growing in a transparent, enclosed container. Select a container big enough to hold 2 or more plants such as a fish bowl, candy jar, aquarium, canning jar or a large bottle (Figure 10-A). Line the bottom and about 1/5 of the side walls of the container with pea-size gravel to provide drainage for excess water (Figure 10-B). Add a thin layer of charcoal over the drainage materials to absorb unpleasant odors which can occur when terrariums are over watered (Figure 10-C). The size and shape of the container will determine the amount of drainage material that should be used. A 1/2-inch (1.3 cm) layer is about the minimum and 1 1/2 inches (3.8 cm) should be enough for large containers.

Place a piece of synthetic fabric over the drainage layer to prevent soil from settling into it and destroying its ability to drain (Figure 10-D). Materials, such as fiberglass draperies, nylon stockings, or discarded curtains are good choices because they are porous enough to allow water to pass through, fine enough to hold soil particles, and will not decompose rapidly.

Figure 10-A. Terrarium container.

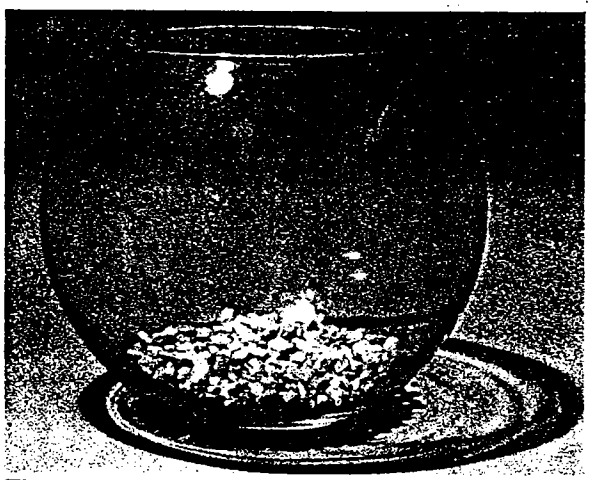

Figure 10-B. Line the bottom of the container and 1/5 of the side walls with pea-size gravel.

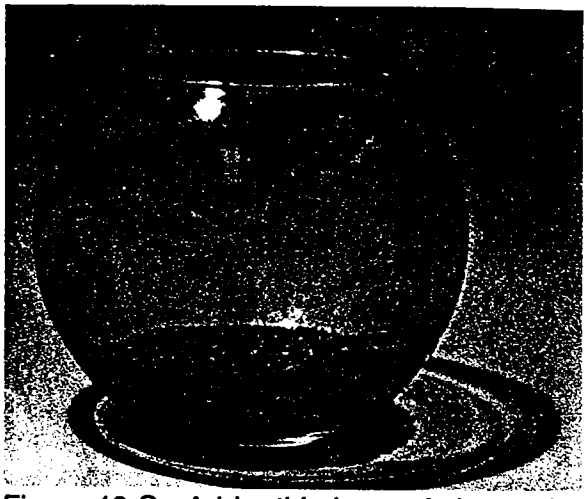

Figure 10-C. Add a thin layer of charcoal over the pea-size gravel.

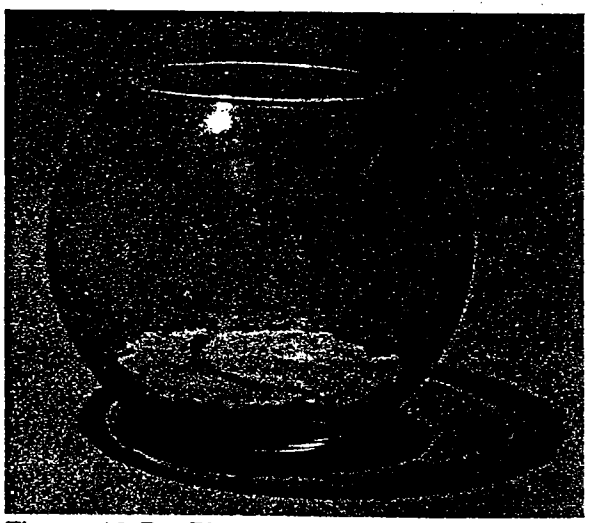

Figure 10-D. Place a piece of synthetic fabric over the drainage layer.

Table 2. Plants for Terrariums

Common Name	Botanical Name
Native Plants	
Artillery Plant	*Pilea microphylla*
Button Fern	*Pellae rotundifolia*
Irish Moss	*Soleiurolia soleirolii*
Liverworts	
Maidenhair Fern	*Adiantum* spp.
Mosses	
Partridgeberry	*Mitchella repens*
Pussy-toes	*Antennaria* sp.
Selaginella	*Selaginella* sp.
Tradescantia	*Tradescantia*
Violet	*Viola odorata*
Wild Strawberry	*Fragaria* sp.
Foliage Plants	
Aglaonema	*Aglaonema* sp.
Baby's tears	*Pilea depressa*
Cast Iron Plant	*Aspidistra elatior*
Dracaena	*Dracaena* sp.
Episcia	*Episcia* sp.
Fern Asparagus	*Asparagus setaceus*
Fernleaf-inch plant	*Tripogandra multiflora*
Fittonia	*Fittonia verschaffeltii*
Jade Plant	*Crassula argentea*
Norfolk-Island pine	*Araucaria heterophylla*
Pellionia	*Pellionia* sp.
Piggyback Plant	*Tolmiea menziessi*
Prayer Plant	*Maranta leuconeura* 'Kerchoviana'
Stawberry Geranium	*Saxifraga stolonifera*
Swedish Ivy	*Plectranthus* sp.
Wax plant	*Hoya carnosa*

Next, add enough sterilized soil mix to fill approximately 1/5 of the container, being careful to keep the soil off the walls of the container (Figure 10-E). Premixed potting soils can be purchased for terrariums. These soils are sterilized and, therefore, do not contain disease organisms which may cause rot or deterioration of the plants. If you prefer, you can prepare your own soil by mixing equal amounts of garden soil and peat moss.

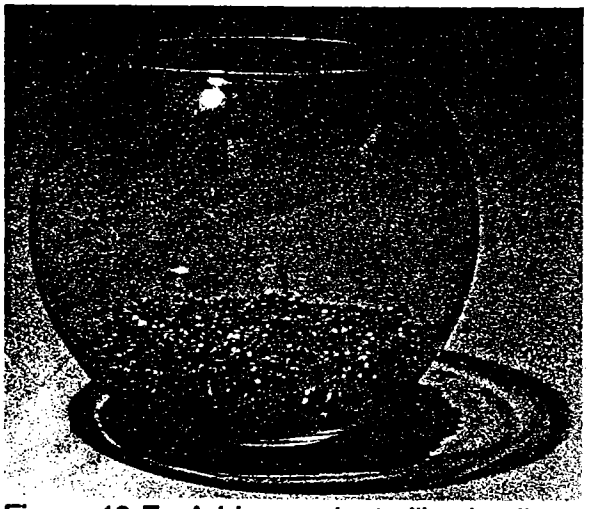

Figure 10-E. Add enough sterilized soil mix to fill approximately 1/5 of the container.

To kill harmful disease organisms, moisten and bake the soil in a tray or pan at 200°F for 20 minutes, stirring every 5 minutes. A complete fertilizer such as 6-6-6 or 8-8-8 can be added after sterilization, although it is not necessary. If fertilizer is added it should be mixed in with the soil at the rate of 1 teaspoon per gallon of soil mix. The soil can be leveled or molded into contours and valleys with a tablespoon, teaspoon or any other blunt instrument.

After the soil has been arranged in the container, plants can be selected (Table 2), arranged and planted. It may be helpful to work out the arrangement of the plants in an open tray that is about the same size and shape as the lower part of the container that you have selected for your terrarium (Figure 10-F).

If the terrarium is to be viewed from all sides, the largest plant should be planted near the center (Figure 10-G). If the terrarium is to be seen only from 2 or 3 sides, the tallest plant should be placed in the background. Place accessories such as stones, figurines, sand and driftwood at the desired location in the terrarium (Figure 10-H). Water plants sparingly since excess water will saturate the soil and may cause disease (Figure 10-I).

Figure 10F. Work out the arrangements of the plants before placing them in the container.

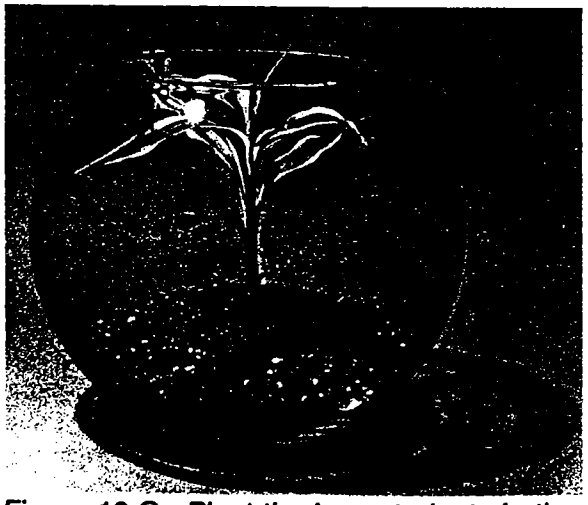

Figure 10-G. Plant the largest plants in the center of the terrarium that will be viewed from all sides.

Cover and place the terrarium where it is exposed to bright indirect light usually in a northeast or north window (Figure 10-J). Avoid direct sunlight, as this will increase the air temperature inside the terrarium and may burn the plants. If the sides of the container become foggy due to the condensation of water, remove the lid until all condensation evaporates; then replace the lid.

Figure 10-H. After all plants are planted, place accessories such as stones at desired locations in the terrarium.

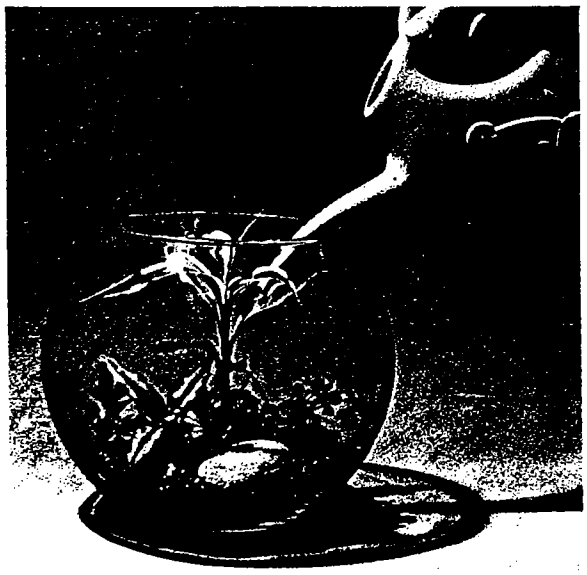

Figure 10-I. Water plants by adding only enough water to moisten the soil.

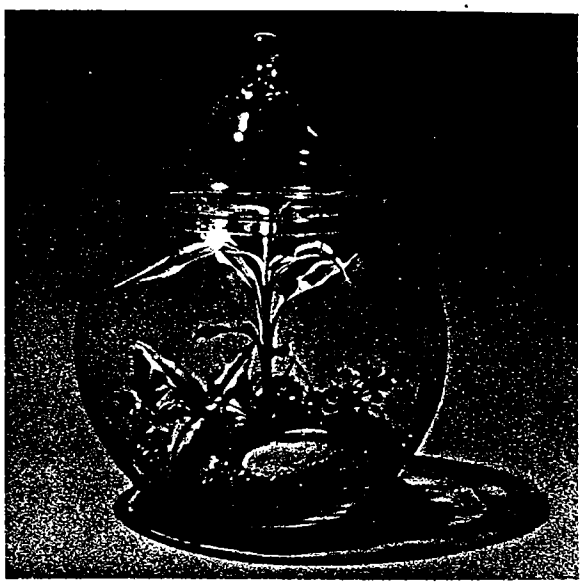

Figure 10-J. Cover and place terrarium near a window facing north or northeast where it will not be exposed to direct sunlight.

Too much water is the number one terrarium maintenance problem. Terrariums should only be watered when the soil is dry to the touch. Since the container has no drainage, add only enough water to moisten the soil.

The failure of many terrariums is due to over-fertilization. If fertilizer is added at planting, there is no need to add more unless the plants begin to develop a slight yellow coloration. If this happens, apply a water soluble house plant fertilizer at 1/4 the recommended rate.

Activity II - Making a Hanging Basket

A container holding living plants hung from a support is called a hanging basket. The container basket may be a wooden box, a moss-lined wire or plastic mesh basket, plastic pot, or a decorative ceramic container. A container filled with soil is very heavy, so strong wire, chain, rope or leather is needed to hang the basket.

A good soil mix for most foliage and flowering plants grown in hanging baskets is 2 parts peat, 1 part sand, and 1 part perlite. Ferns grow well in peat moss, sphagnum moss, or a mixture of one of these and half perlite.

Almost any type of vining, trailing or cascading plant can be used in a hanging basket. Blooming plants suitable for use in full sun locations include petunias (*Petunias* x *hybrida*), verbena (*Verbena* x *hybrida*), and lantana (*Lantana montevidensis*). Some of the most popular foliage plants used in hanging baskets are presented in Table 3.

If you use a wire or plastic mesh basket, it must be lined with some material to hold the soil in the container. Usually the basket is lined with a 2-inch layer of sphagnum moss (Figure 11-A). Wet the sphagnum moss prior to pressing it on the bottom and sides of the basket. If you wish to reduce quick drying of the soil in the basket, place a layer of plastic or foil next to the moss prior to filling the basket with soil (Figure 11-B). Punch small holes in the lining to assure good drainage. Next, fill the basket with a potting mix within 1/2-inch of the rim (Figure 11-C) and plant the desired plant (Figure 11-D). Water thoroughly after planting and hang the basket in a suitable location for the plant.

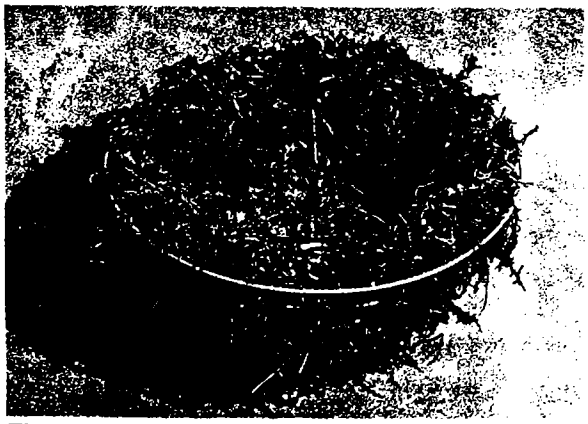

Figure 11-A. Line a wire or plastic mesh basket with a 2-inch layer of sphagnum moss.

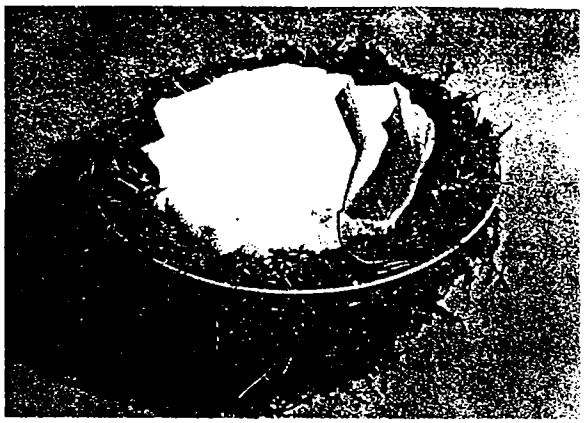

Figure 11-B. Place a layer of plastic or foil next to the moss before filling the basket with soil.

Figure 11-C. Fill the basket with a potting mix within 1/2-inch of the rim.

Figure 11-D. Plant the desired plant.

Once the hanging basket is in place, watering, fertilizing, grooming, and repotting will be required periodically.

Table 3. Selected Foliage Plants for Hanging Baskets

Common Name	Botanical Name
Arrowhead Vine	*Syngonium podophyllum* numerous cultivars
Blushing Bromeliad	*Neoregelia carolinae*
Burro-Tail	*Sedum morganianum*
Climbing onion	*Bowiea volubilis*
Compact Boston Fern	*Nephrolepsis exaltata* 'Compacta' (and numerous other cultivars of *N. exaltata*)
Crab cactus	*Schlumbergera bridgesii*
Creeping Charlie	*Pilea nummularifolia*
Creeping Fig	*Ficus pumila*
Delta Maidenhair Fern	*Adiantum Raddianum*
Devil's Ivy	*Epipremnum aureum*
Drunkard's Dream	*Hatiora salicornioides*
Ellen Danica Grape Ivy	*Ciccus rhombifolia* 'Ellen Danica'
English Ivy	*Hedera helix* (numerous cultivars)
Fiji Rabbit's-Foot Fern	*Davallia fejeensis*
Fireball Bromeliad	*Neoregalia* x 'Fireball'
Flame Violet	*Episcia cupreata* (numerous cultivars)
Grape Ivy	*Ciccus rhombifolia*
Heart-Leaf Philodendron	*Philodendron scandens oxycardium* (*P. oxycardium*)
Lace Cactus	*Mammillaria elongata*
Majesty Philodendron	*Philodendron* 'Majesty'
Marble Queen Devil's Ivy	*Epipremnum aureum* 'Marble Queen'
Miniature Wax Plant	*Hoya bella*
Prayer Plant	*Maranta leuconeura leuconeura*
Red-vein Prayer Plant	*Maranta leuconeura erythrouneura*
Rosary Vine	*Ceropegia Woodii*
Satin Pellionia	*Pellionia pulchra*
Satin Pothos	*Scindapsus pictus* 'Argyraeus'
Silver Nerve Plant	*Fittonia verschaffeltii argyroneura*
Sprenger Asparagus	*Asparagus densiflorus* 'Sprengeri' (*A. sprengeri*)

Common Name	Botanical Name
Swedish Ivy	*Plectranthus australis*
Tahitian Bridal Veil	*Gibasis geniculata*
Teddy-Bear Vine	*Cyanotis kewensis*
Trailing Maidenhair Fern	*Adiantum caudatum*
Tricolor Blushing Bromeliad	*Neoregelia Carolinae* 'Tricolor'
Variegated Philodendron Peperomia	*Peperomia scandens* 'Variegata'
Variegated Rooting Fig	*Ficus sagittata* 'Variegata'
Velvet-Leaf Philodendron	*Philodendron scandens*
Vining Peperomia	*Peperomia dahlstedii*
Wandering Jew	*Zebrina pendula*
Wax Plant	*Hoya carnosa* (numerous cultivars)
White-Stripe Spider Plant	*Chlorophytum comosum* 'Vittatum'
White-Velvet	*Tradescantia sillamontana*

III - Making A Dish Garden

A dish garden is a miniature landscape in an open, shallow container. Ceramic dishes (Figure 12-A), milk cartons, jars, cans and hollowed-out logs make good containers. Provide drainage by punching holes in the bottom of soft containers or drilling holes in ceramic dishes. If this is not practical, provide internal drainage by placing a thin layer (1/2 - 1 1/2 inches) of pea-size gravel or charcoal in the bottom of the container (Figure 12-B). Cover the drainage layer with a piece of synthetic fabric (nylon stocking or fiberglass drapery) to prevent soil from settling into it and destroying its ability to drain (Figure 12-C). Cover the drainage layer with 2 to 4 inches of soil mix (1 part peat to 1 part sand), depending on the depth of the container (Figure 12-D).

Select and arrange plants in a pleasing design. Choose your plants according to where the garden will be placed in the home. If the garden is to be displayed in a low-light area, choose foliage plants such as snake plant, parlor palm, jade plant, Chinese evergreen and birdsnest sansevieria. Plants for medium light areas are schefflera, grape ivy, dracaena, philodendrons, diffenbachia and pothos.

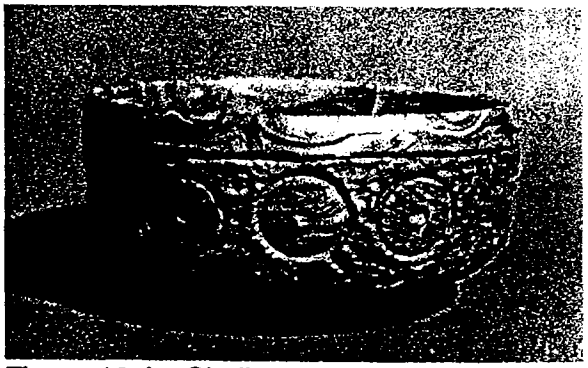

Figure 12-A. Shallow ceramic pots make good dish garden containers.

Arrange plants according to how the dish garden is to be viewed. If it is placed on a table and viewed from all sides, the largest plants should be planted near the center (Figure 12-E). When viewed from one or two sides, the tallest plants should be placed in the background.

Set plants in holes only as deep as they were growing in their containers and firm the soil around the roots. Water just enough to moisten the soil. With a little care your dish garden will become a beautiful decoration for your home (Figure 12-F).

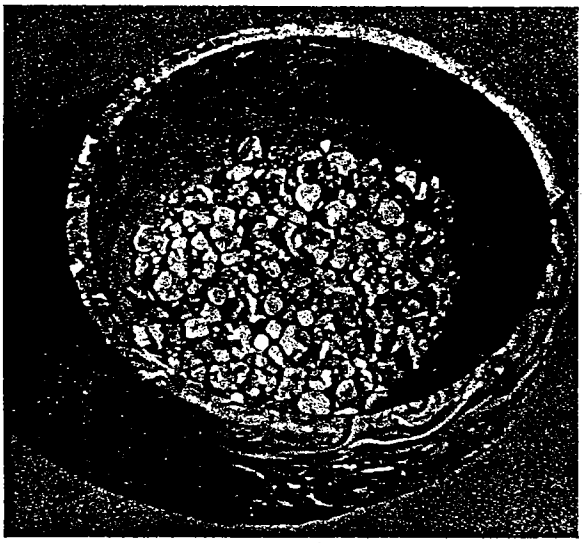

Figure 12-B. Place a 1/2 to 1 1/2-inch layer of pea-size gravel or charcoal in the bottom of the container.

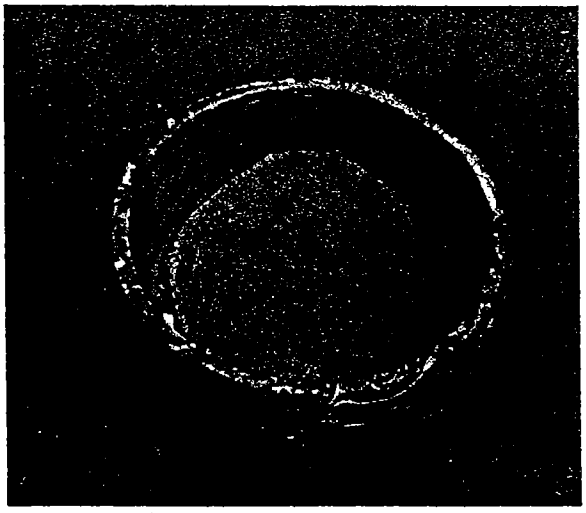

Figure 12-C. Cover the pea-size gravel with a piece of synthetic fabric.

Figure 12-D. Cover the gravel layer with 2 to 4 inches of soil mix.

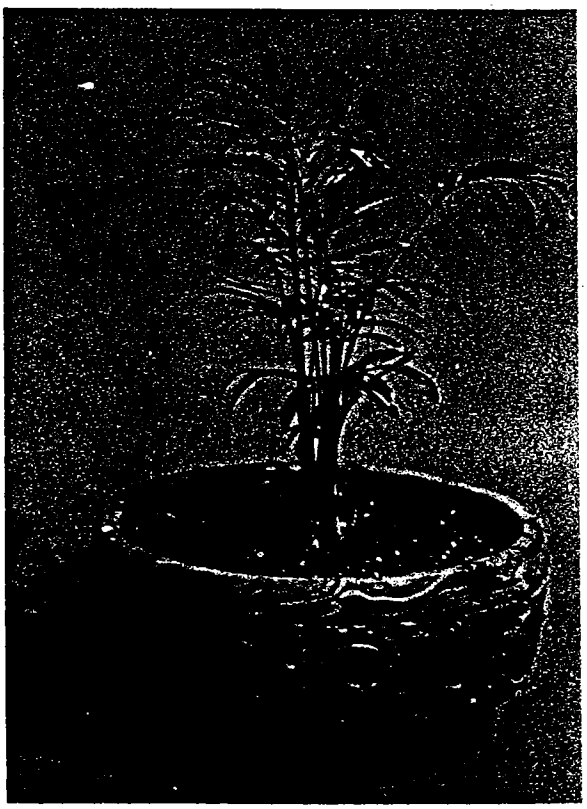

Figure 12-E. Plant the largest plants in the center of dish gardens that will be viewed from all sides.

Figure 12-F. With proper care a dish garden should provide years of enjoyment.

Activity IV - Making a Desert Dish Garden

A desert dish garden is a miniature landscape made with plants called succulents. Succulents are plants which survive hot, dry climates, because of their ability to store water in their stems and leaves during rainy periods. They lose moisture more slowly than most other plants because their leaves and stems have protective coverings of wax or hairs. Their ability to survive drought conditions for long periods of time make them excellent plants for a dish garden.

The most popular succulents used in desert dish gardens are cacti. Other succulents that can be use in a desert dish garden are aloes, jade plants, agaves, euphorbias and echeverrias.

Any dish, pan or tray which is at least 2 inches deep can be used. If the dish does not have a drainage hole, provide internal drainage by placing a thin layer of pea-size gravel in the bottom of the container. Fill the container to within 1/4-inch of the top with a soil mixture of 2 parts sand and 1 part peat.

Choose succulents of different sizes and shapes and move them on top of the soil until you find an interesting design. If the dish garden is to be viewed from all sides, place taller plants in the center and smaller ones along the sides. If the garden is to be viewed from one side, place taller plants in the back and smaller ones toward the front, so that all plants can be seen well. Scoop out soil to set plants in holes and press the soil firmly around the roots. Place a layer of sand or small pebbles on the soil surface to keep leaves and stems dry. Pieces of wood, rocks, and/or figurines can be added for interest.

Water the garden and place it in a location where it will receive some sunlight. Do not water again until the soil becomes dry. Overwatering will increase the chances of root and stem rot, and eventual death of the plants in your desert dish garden.

Activity V - Making a Totem

Vining foliage plants grown on a tree fern slab, wood slab or small limb are called totems. Climbing types of foliage plants such as grape ivy, English ivy, wax plant, philodendrons and pothos are good choices for totems. Select a container which has a drainage hole in the bottom and is large enough for the plant of your choice and a tree fern or bark slab. Choose a tree fern or bark slab which is 3 to 5 times taller than the container. Hold the slab upright in the container, then pack 2 to 4 inches of potting mix firmly around the slab (Figure 13-A). Set the plant in the pot and add more potting mix (Figure 13-B). Never set the plant deeper than it was originally growing. Fasten the stems to the slab with tape, twistems or string until

roots attach themselves (Figure 13-C).

Figure 13-A. Hold the bark slab upright in the container then pack 2 to 4 inches of potting mix firmly around the slab.

Figure 13-B. Place plant in the pot and add more potting mix.

Totems require the same amount of care as any other potted foliage plant. In a few months, the entire totem should be covered by the foliage plant.

Activity VI - Windowsill Water Garden

Many house plants can be grown without soil in a container filled with water. Select a container that will fit on your windowsill. Purchase plants in 2 or 3-inch pots or take cuttings from plants that root easily in water. Purchase a small bag of

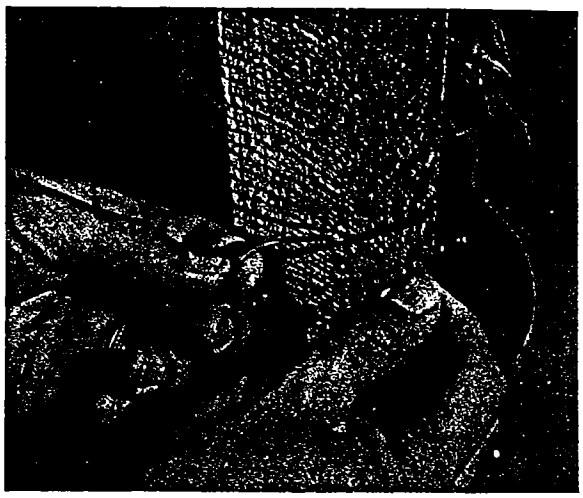

Figure 13-C. Fasten plant stems to the slab with tape, twistems or string.

marble chips or aquarium stones. Wash the stones and place them in a 1-inch layer on the bottom of the container. Next add a layer of charcoal, followed by a layer of coarse sand.

Remove the plants from the pots, being careful not to damage the roots. Remove the soil from around the roots by washing under running water. Trim any dead or damaged roots and arrange the plants on the sand. Add gravel around the plant roots up to the stem, but no higher than the plant was originally growing. A top layer of polished Japanese mini-stones can be added for the final layer. For plants that lean, an interesting rock can be added for support.

The watering solution is made by mixing 1/4 of the recommended amount of liquid fertilizer to the water. The unused solution can be stored in a labeled container. Add the fertilizer solution until it reaches 1/2 the upper level of gravel. The solution should be maintained at this level. The solution should be changed every 6 weeks. Plants that become too tall for the window should be pruned back.

Table 4. Plants suitable for Windowsill Gardens.

Common Name	Botanical Name
Aglaonema	*Aglaonema* sp.
Arrowhead plant	*Syngonium podophyllum*
Coleus	*Coleus blumei*
Croton	*Codiaeum variegatum*
Dumbcane	*Dieffenbachia* sp.
Dwarf umbrella plant	*Schefflera arboricola*
English ivy	*Hedera helix*
Hawaiian ti	*Cordyline terminalis*
Parlor palm	*Chamaedorea elegans*
Philodendron	*Philodendron* sp.
Pothos	*Epipremnum aureum*
Spathiphyllum	*Spathiphyllum* sp.
Wandering jew	*Tradescantia albiflora*

RECORD BOOK
4-H Indoor Gardening Project:
Grow House Plants

NAME: _____ AGE: _____
ADDRESS: _____ YEARS IN 4-H: _____
_____ YEARS IN PROJECT: _____
_____
CLUB: _____

What I hope to learn:

What I learned:

List at least 5 house plants you have learned to identify:

Record of Plants (at least 3 plants)

Name of Plant	Source of Plants	Cost	Date Potted or Repotted	Light requirement (low, med, high)
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
		_____		
		Total		

Activities:
Briefly describe each activity completed and indicate expenses if any.
Activity

Materials used	Cost
_____	_____
_____	_____
_____	_____
_____	_____
Total Cost:	_____

Activity

Materials used	Cost
_____	_____
_____	_____
_____	_____
_____	_____
Total Cost:	_____

Demonstrations, Talks, and Shows

Demonstrations or Talk Title/Item Exhibited	Place	Placing
1.		
2.		
3.		
4.		
5.		
6.		
7.		

Add drawings or photographs showing the stages of development of the project from beginning to end.

Project Story (add additional sheets if necessary)

List of Figures

Figure 10-H. After all plants are planted, place accessories such as stones at desired locations in the terrarium.

Figure 10-I. Water plants by adding only enough water to moisten the soil.

Figure 10-J. Cover and place terrarium near a window facing north or northeast where it will not be exposed to direct sunlight.

Figure 11-A. Line a wire or plastic mesh basket with a 2-inch layer of sphagnum moss.

Figure 11-B. Place a layer of plastic or foil next to the moss before filling the basket with soil.

Figure 11-C. Fill the basket with a potting mix within 1/2-inch of the rim.

Figure 11-D. Plant the desired plant.

Figure 12-A. Shallow ceramic pots make good dish garden containers.

Figure 12-B. Place a 1/2 to 1 1/2-inch layer of pea-size gravel or charcoal in the bottom of the container.

Figure 12-C. Cover the pea-size gravel with a piece of synthetic fabric.

Figure 12-D. Cover the gravel layer with 2 to 4 inches of soil mix.

Figure 12-E. Plant the largest plants in the center of dish gardens that will be viewed from all sides.

Figure 12-F. With proper care a dish garden should provide years of enjoyment.

Figure 13-A. Hold the bark slab upright in the container then pack 2 to 4 inches of potting mix firmly around the slab.

Figure 13-B. Place plant in the pot and add more potting mix.

Figure 13-C. Fasten plant stems to the slab with tape, twistems or string.

Definition of Terms

Bacteria	Single celled organisms, so small that they cannot be seen by the naked eye.
Bark slab	The outside piece of wood with attached bark cut from a log.
Botanical name	A name for which a plant is known worldwide. A plant may have several common names, but only one botanical name.
Cacti	One of a group of plants called succulents. These plants are able to survive hot, dry climates, because they store water in their stems and leaves during rainy periods. Cacti are distinguished from other succulents by the presence of spine cushions. Whether or not spines are present, all cacti have spine cushions.
Charcoal	A black, porous material obtained by partially burning wood. This material is used in terrariums to absorb unpleasant odors.
Chilling	Exposure to cold temperatures above freezing.
Contours	Furrow or rides on the soil surface.
Cutting	A section of a plant (stem, leaf or root) capable of developing into a new plant.
Fern slab	A section of the trunk of tree fern.
Florist	A person who sells flowers and other ornamental plants. Florists specialize in the sale of flower arrangements.
Foliage plants	Plants grown primarily for the beauty of their leaves and stems. Because of the susceptibility of these plants to cold injury, they are usually grown indoors.
Foot candle	A measure of the light usually determined with an instrument called a light meter. One foot candle is the amount of light falling on one square foot of surface located one foot away from a candle.
Fungi	A group of lower plants that cannot produce their own food. They obtain their food from living or dead organisms. They are responsible for many plant diseases.
Glazed clay pots	Smooth surface, nonporous, clay pots. These pots are very attractive and do not allow water to evaporate through the sides.
Humidity	The amount of water vapor in the air.
Indirect light	Light that is reflected from one surface to another.
Nutrients	Substances that are needed by a plant to grow and sustain life.

Peat	Partly decayed plant material that accumulates wherever water and acidity slows down the process of decay.
Perlite	Very light-weight, porous material that is white in color. It is used in soil mixes to increase drainage and aeration.
Pine bark	Bark that is removed from a pine tree log during the milling process. It is often used as a component of soil mixes.
Porous	Possessing pores or holes which allow passage of a liquid.
Pot bound	A condition that occurs when a plant is grown in the same pot for several years. The plant's root system gets larger, eventually filling the container and restricting plant growth until more room is provided by repotting.
Potting mixture	A material developed by combining several substances (peat, perlite, pine bark, sand, etc.) for growing plants in pots.
Repotting	Moving of a plant from the pot in which it is growing to another pot. This is usually done when a plant has become too large for the original pot.
Sphagnum moss	Partly decayed remains of the sphagnum moss plant. This material has properties similar to a sponge in that it holds water and is spongy to the touch.
Sterilized soil	Soil that has been exposed to high temperature or treated with chemicals to kill disease organisms.
Succulents	Plants that are able to survive hot, dry climates by storing water in their stems and leaves and/or reducing their water needs. Cacti belong to this group of plants.
Transplanting	Digging a plant from one place and planting it in another.
Waterlogged soil	Soil saturated with water to the point of sogginess. This condition is not desirable for the growth of most plant roots.
Water soluble	Capable of being dissolved in water.

UNIVERSITY OF FLORIDA
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