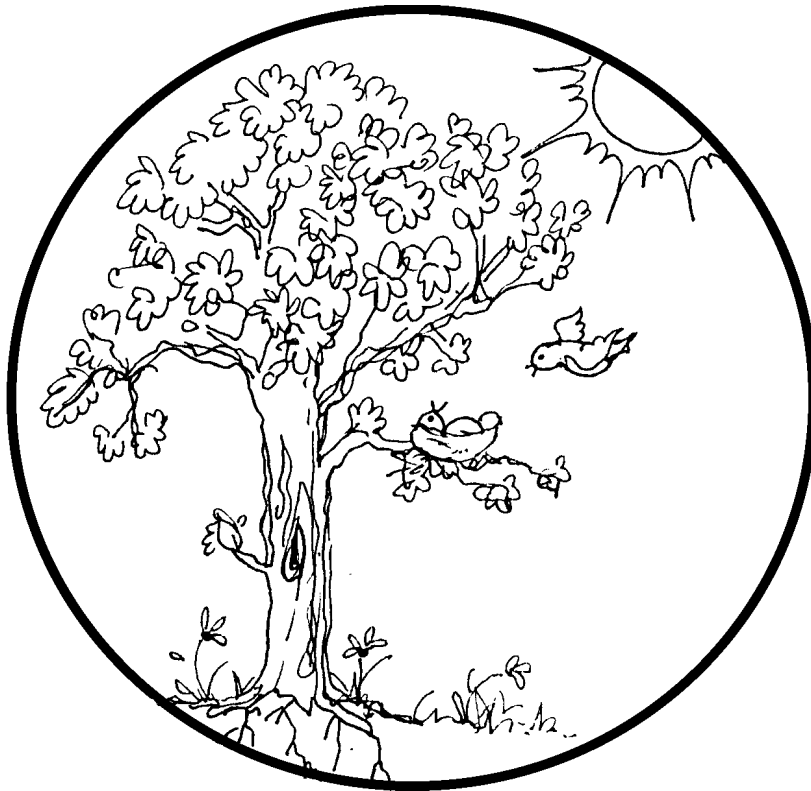




**Life Cycle**  
Diversity in a Balance



**KINDERGARTEN**  
**PLANT LIFE**



2 weeks  
LESSON PLANS AND  
ACTIVITIES

## LIFE CYCLE OVERVIEW OF KINDERGARTEN

### ORGANISMS

#### WEEK 1.

PRE: *Comparing large and small organisms.*

LAB: *Classifying and investigating large organisms.*

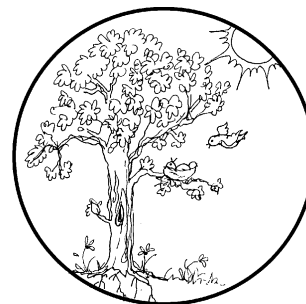
POST: *Comparing where large animals live.*

#### WEEK 2.

PRE: *Observing how and where organisms live.*

LAB: *Comparing shells.*

POST: *Comparing plants and animals.*



### HUMAN BIOLOGY

#### WEEK 3.

PRE: *Discovering the different parts of the body.*

LAB: *Discovering and locating parts of the body.*

POST: *Distinguishing the function of external body parts.*

#### WEEK 4.

PRE: *Discovering why bones are important.*

LAB: *Comparing different models of skeletons.*

POST: *Exploring how teeth grow.*

### PLANT LIFE

#### WEEK 5.

PRE: *Exploring how seeds grow.*

LAB: *Planting seeds.*

POST: *Exploring the uses of plants.*

#### WEEK 6.

PRE: *Defining the parts of a tree and flower.*

LAB: *Comparing seeds and the plants they produce.*

POST: *Comparing flowers, stems, and leaves.*

### NATURAL ENVIRONMENT

#### WEEK 7.

PRE: *Exploring land and marine environments.*

LAB: *Comparing and contrasting environments.*

POST: *Describing a favorite environment.*

#### WEEK 8:

PRE: *Exploring the order of a natural community.*

LAB: *Dramatizing who eats whom.*

POST: *Characterizing producers and consumers.*

## LIFE CYCLE - PLANTS (KA)

### PRE LAB

Students determine what is a plant by using a worksheet.

### OBJECTIVES:

1. Describing plants.
2. Exploring how seeds grow.

### VOCABULARY:

bulb  
photosynthesis  
seed

### MATERIALS:

crayons  
worksheet



### BACKGROUND:

Plants are living organisms and share common characteristics with all other living things. All organisms are composed of cells, grow, reproduce, and respond to various kinds of stimuli like temperature. However, plants have additional characteristics which distinguishes them from other organisms. Plants have the ability to manufacture food (photosynthesis); have unlimited or almost unlimited growth; and cell walls made of cellulose (used in making paper). Students should learn that most plants are green, have roots, grow, have flowers, have leaves, live in soil, and drink water.

The kingdom of plants includes seed plants, algae, ferns, and mosses. Plants have many cells and tissues. They make their own food using chlorophyll (the green pigment) through a chemical process called photosynthesis, which converts water and carbon dioxide into sugars, if there is enough light. They do not move on their own.

Children sometimes mistake some invertebrate animals, like coral or sea anemones as plants. Children reason that if it looks like a plant, it is a plant. Even mushrooms, most children think is a plant because it grows. Children that just see a part of plant like a bulb, root, or seed may not think it is a plant because it is not green.

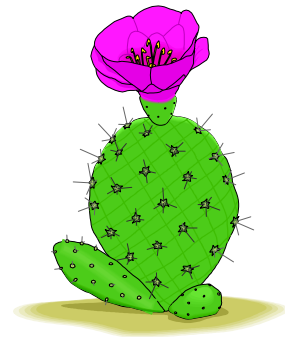
### PROCEDURE:

1. Discuss with students the needs of plants which include water, air, soil, light, and moderate temperatures. You may want to make an overhead of the worksheet and discuss with children why or why not each is a plant. For each box ask students to answer the following questions in their mind before they answer yes or no.

Does it move? (no)  
Does it make its own food? (yes)  
Can it live in the dark? (no)  
Does it need soil to grow big? (yes)  
Is it green? (yes)  
Is it part of a plant? (yes or no)

2. If their answer corresponds then it is most likely a plant. Get your students to reason out the answer and not to just give an answer. Although the frog is green it isn't a plant and an onion is only part of a plant, that's why it isn't green. The mushroom is not a plant, it is a fungi which cannot produce its own food from the sun.

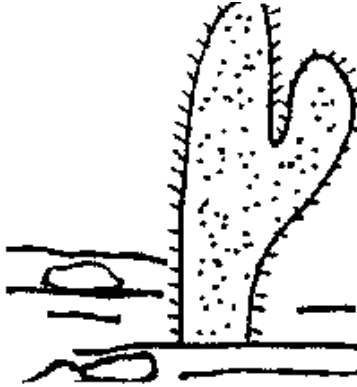
3. You may want to go outside and have the students determine what is a plant. Remember even grasses and weeds are plants!



## WHAT ARE PLANTS?



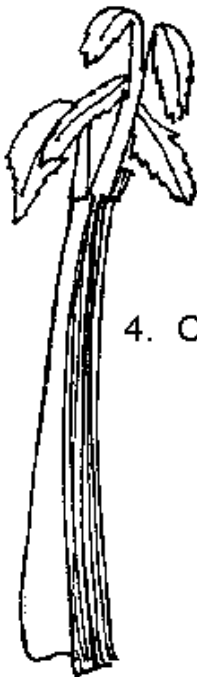
1. Grass



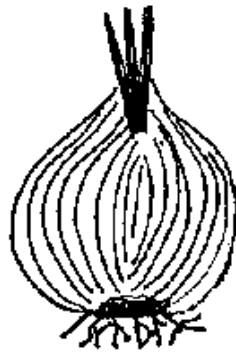
2. Cactus



3. Carrots



4. Celery



5. Onion



6. Flower



7. Frog



8. Mushroom

PUT A CIRCLE AROUND THOSE THINGS THAT ARE PLANTS?

## LIFE CYCLE - PLANTS (KA)

### LAB

Students plant a seed and watch it grow.

### OBJECTIVES:

1. Planting seeds.
2. Experimenting with the requirements of plant growth.

### VOCABULARY:

light  
nutrient  
seed  
water

### MATERIALS:

milk containers  
soil  
seeds  
water  
plastic spoons  
rocks



### BACKGROUND:

Planting and watching seeds grow is a wonderful experience for children. A seed is like magic, a seemingly lifeless thing, that can grow into a living plant. Growing seeds can be a very inspirational activity, especially if the children are allowed to watch the seed grow and mature. Watching plants grow will also teach students patience and observational skills.

The requirements for growing a plant is water, nutrients, and sunlight. Too much or too little of these requirements can prevent a plant from growing. This activity has the students looking at the key components of nutrients, so they need to have the soil. In the first grade the students will grow seeds again, but without the soil. In the first grade they will be concentrating on actual mechanism of growth, while kindergarten is focused on all the components.

### PROCEDURE:

During this activity the students will prepare the growing environments for their seeds, plant them, water them, and then watch them grow. Prior to this activity you may request from parents any old seeds that they may not have used.

1. Save milk containers and cut off the tops. Punch small holes at the bottom of the containers. Tell the students that when the seeds grow and the roots get larger, they need air. Water is important, but too much water sitting in the container can "rot" the roots. The rocks are used to prevent the roots from touching the bottom and getting water soaked. Instruct students to place a few small rocks on the bottom of the milk container, just enough to make one layer. Get a bucket of soil and have the students fill the milk containers 3/4 full of soil.

2. Place the seed about 1 centimeter into the soil. This will vary depending on the type of seed (refer to the package the seeds came in). When the students water their seeds, first have them use a spray bottle to water, so that they make the "home" for the seed ready because pouring water will unsettle the seed. They can start to pour water, when the seed starts to root.

3. Move the seed to a warm area, but not into direct sunlight. Again this will depend on the seeds. The seed provides food for the plant until the leaves are formed, which will then let the plant produce its own food. We recommend that you read the directions to the students so they understand that you must do this for each package of seeds you get.

4. Be careful that the students do not over water their seeds. It is OK for the soil to dry a little, a soaking wet soil is not the best environment.

## LIFE CYCLE - PLANTS (KA)

### POST LAB

Students look closely at items made from plants.

### OBJECTIVES:

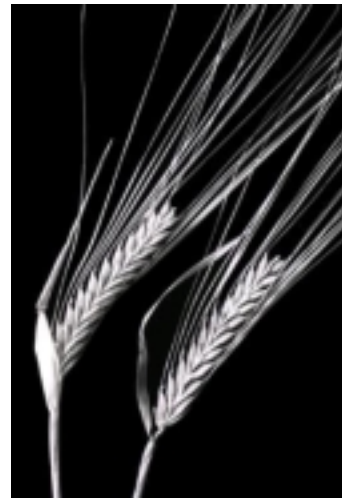
1. Exploring the uses of plants.
2. Showing and demonstrating some uses of plants.

### VOCABULARY:

fiber  
plant

### MATERIALS:

items that are made from plants  
Swift GH Microscope or hand lens



Flour is made from wheat.

### BACKGROUND:

Plants are very useful in our society. The old saying, "Either you grow it, or mine it," still holds true. Children are not aware of where items they use everyday come from. Plants may be used for decoration, erosion and climate control (wind breaks and shade), foods, beverages, flavoring, medicines, fabrics, rope and other fibers, wood, rubber, dyes, paper, and many other uses.

Many clothes are still made from cotton, which is grown on plants and harvested. Fabric that is made of polyester is synthetic and has a petroleum base. Medicines like aspirin come from a tree. Scientists are discovering new medicines from plants every year. The taste from many soft drinks, even cola, comes from various plants. Plants most important contribution to humans, is the food potential. Grains are used in many food products, especially flour. Even the morning breakfast is from plants. Oatmeal from oat; corn flakes from corn; and bran flakes from wheat. Most societies are based on one grain as their staple. Many parts of Asia use rice; parts of North America and Europe use flour; and Central America uses corn as its staple.

### PROCEDURE:

1. Instruct children to look around the classroom for items made from plants. They might find paper, wood desks, rulers, balloons, rubber bands, erasers, cotton shirts, decorative plants, something made with natural dyes, pencils, twine, baskets, bayberry candles, mint chewing gum (both gum and flavoring come from plants) and many other things. Make a list on a piece of paper. Continue writing new items when students go



home and ask their parents if they know anything else that comes from plants.

2. Most students do not realize that cotton is grown on a plant. If you have a cotton plant with a bud of cotton, show the students that the little ball of cotton is then made into fibers that can be used for spinning. Show students different kinds of cotton fabric. Explain to students the difference between wool and polyester. Wool is from sheep and polyester is from an oil based product. You may want the students to bring one or two products from home that are made from plants. Have a "show and tell," products from plants.

3. Put a few microscopes out with different types of fabric. Let the students look at the differences in the threads that make up the various fabrics. Cotton fibers, for instance, have a distinct texture composed of flat ribbons. Linen fibers are jointed like bamboo.

4. You may want to make another list of plant foods that students ate. Instruct them to ask their parents help and read labels of items they eat, to see if plants were involved in making the product.

## LIFE CYCLE - PLANTS (KB)

### PRE LAB

Students use a worksheet to compare parts of a flower and a tree.

### OBJECTIVES:

1. Defining the parts of a tree and flower.
2. Exploring parts of a plant.

### VOCABULARY:

leaf  
petals  
roots  
shrub  
stem  
trunk  
wood



### MATERIALS:

worksheet  
*Look Inside a Tree* by G. Ingoglia

### BACKGROUND:

Woody plants are woody, hard, with thick stems, and are generally long lived. Examples of woody plants are trees and shrubs. The major parts of a wood plant are the leaves, branch, trunk, and roots. The leaves are an outgrowth of the stem and are usually thin and flat, needle-like or scale-like, and usually green in color due to the presence of chlorophyll. Leaves provide the surface area necessary for absorption of sunlight which begins the process of photosynthesis.

The branch is a secondary wood limb growing from the trunk of a plant. It helps transport materials from the tree trunk to the leaves. The trunk is a massive primary stem of a tree located between the roots and upper tree canopy. The trunk provides upright support to trees and transports nutrients and water from the roots to the leaves of a tree. The roots are usually not green and are found beneath the soil and are greatly branched or netted in appearance. Roots absorb water and minerals from the soil and anchor the plant to the ground and store food materials.

Herbaceous plants or small flowers are soft and green with little or no wood stems. These plants are generally short lived. Examples include grasses, garden vegetables, and flowers. Petals are usually brightly colored with distinctive colors and are used mainly to attract insects for the purpose of cross pollination (i.e., exchange of pollen from one flower to another).

The leaf has the same description as that for wood plants with the exception of being needle-like or scale-like in structure. The function of a leaf is the same as in wood plants.

The stem is the structure between the roots and the leaves, and may be woody or non-woody. The stem transports water and minerals from roots to other parts of the plant and provides for the support of leaves.

The roots have the same description and function as in wood plants.

## **PROCEDURE:**

1. Discuss with students the major plant parts and their functions. You may want to use a book to illustrate this. We recommend *Look inside a Tree*, which illustrates the different parts of a tree. Make sure you emphasize:

a. Leaves are used by plants to make their own food from the Sun. Leaves are usually green and found on the outside of the plant. However, leaves on some trees will fall, but new ones will grow.

b. A trunk and branches are only found on trees. The woody tissue from trunk helps support trees to grow large. Branches help the trees find a place for the leaves to grow and “feel” the sun.

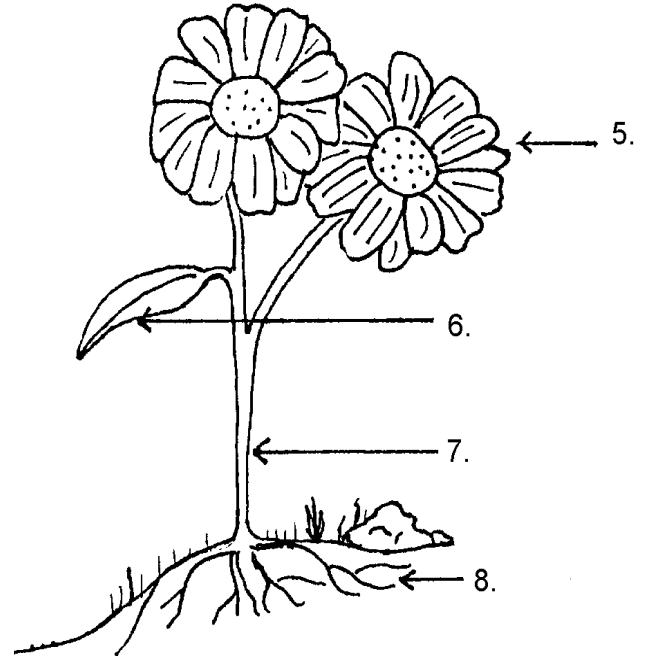
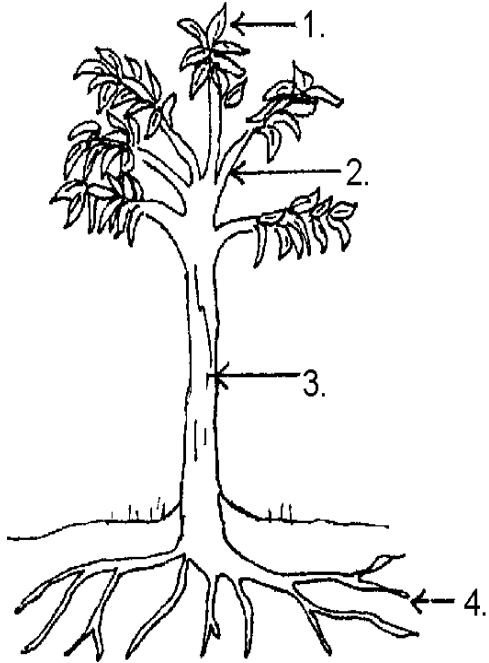
c. A stem is found on small non-woody plants. They do not have the support to make the plant grow large.

d. Roots are hidden from view. They help the plant to anchor itself into the ground. The main function is to get nutrients from the soil and bring them to the leaves so the leaves can make food for the plant.

e. A petal is part of a flower, which many plants possess. However, it is used mainly as a way to attract insects to help pollinate the seed.

**ANSWERS:** 1 and 6 are leaves; 3 is the trunk; 4 and 8 are roots; 2 are branches; 5 is a petal; and 7 is a stem.

# PLANT PARTS



- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_
- 5. \_\_\_\_\_
- 6. \_\_\_\_\_
- 7. \_\_\_\_\_
- 8. \_\_\_\_\_

## LIFE CYCLE - PLANTS (KB)

### LAB

Students sort mixed seeds.

### OBJECTIVES:

1. Classifying seeds.
2. Comparing seeds and the plants they produce.

### VOCABULARY:

plant  
seed

### MATERIALS:

Life Cycle - Plants (KB) or bags of mixed seeds (including beans, corn, and other large seeds)

pictures of seeds or Internet



### BACKGROUND:

Seeds come in many different shapes and sizes. A seed is the "baby" plant in waiting.

The purpose of the seed coat is primarily to protect the embryo (or baby) plant against such hazards as excessive drying, mechanical injury, and the digestive juices of animals (if it is eaten). Many seed coats are impermeable to water or oxygen or are hard which helps it remain "asleep" or dormant for a long time. When the conditions are right the dormant seed will grow. Seed coats are frequently specialized and may facilitate dispersal by wind or animals. The winged seeds of some species are familiar examples of wind-dispersed types. In some plants, the seed coat is adhesive (as in mistletoe) or becomes gummy when wet (as in mustard seeds) and adheres to the feet of birds. Hairy seeds may cling to the bodies of animals and be transported for long distances.

Seeds are used by other organisms as food, because seeds have food stored in them. Seeds furnish humans with great proportions of food. A large part of the world relies on the grains of wheat, rice, soybeans, corn, rye, and barley. Oils and fats are produced from the seeds of coconut, corn, cotton, flax, castor bean, sesame, peanut, and soybean. Oil from the cotton seed and peanut is utilized in the manufacture of various products such as butter and lard substitutes and soap. Linseed oil from flax seed is used in the manufacture of paints, varnishes, artificial leather, oilcloth, and linoleum.

## **PROCEDURE:**

In this lab students will be looking at the overall seed, but will mainly classify, compare, and describe the seed coat. Seed coats come in many different sizes and different textures. The key portion of this lab is to look at the different seeds and try to point out what the plant looks like.

1. Have the students classify the seeds into groups that look similar in shape. Then have them look at the outside of the seeds and see if they are smooth or wrinkled.

2. Instruct the students to count how many seeds they have of the same kind. You may want students to record the information on the worksheet. Let them use their imagination when naming the seed, however they may just use color to separate them.

3. Different pictures of seeds can be seen on several web sites. To keep current, we recommend you do a search on “seeds” to help find more pictures.

<http://www.versicolores.ca/seedsoflife/ehome.html>

This site was designed by a photographer. Her pictures show many different seeds in wonderful positions.

LIFE CYCLE - PLANTS (KB)

**DESCRIBE YOUR SEEDS**

name your seed	number	draw your seed

## LIFE CYCLE - PLANTS (KB)

### POST LAB

Students use a worksheet to compare different plants.

### OBJECTIVES:

1. Comparing flowers, stems, and leaves.
2. Distinguishing plants from other living things.

### VOCABULARY:

flower  
leave  
photosynthesis  
stem

### MATERIALS:

worksheet  
crayons



cross section of a tree trunk, showing seasonal growth rings

### BACKGROUND:

The classification of plants can help students think how to group organisms with similar characteristics. Dichotomous keys are ideal for plant classification. You can either eliminate or include plants based on several key characteristics. For instance, if it has woody tissue (bark) it can be a tree. Leaves, types of seed, overall shape, type of flowers produced can all help in identification. In the lower grades it is important for students to look at the characteristics that will enable them to later identify the different groups of plants.

The plant kingdom can include one celled organisms (diatoms) as well as complex organisms like angiosperms (which are trees but yet have flowers). A main division of plants and trees is based on whether they have vascular tissue or well-developed conducting tissue through which water and solutes pass to various parts of the plant (tracheophytes). Other plants are non-vascular (bryophytes) and do not possess internal transport systems. Most non-vascular plants live in water or in wet environments that facilitate direct diffusion of water and nutrients. Vascular plants, however, live on land and possess special features adapted to this environment: roots, stems and leaves. As in most classification systems, not all botanists agree on the same system.

Kindergarten students should learn to look at plants and try to group them into like plants. Learning about identifying different types of leaves and bark will help them later group them into the larger groups.



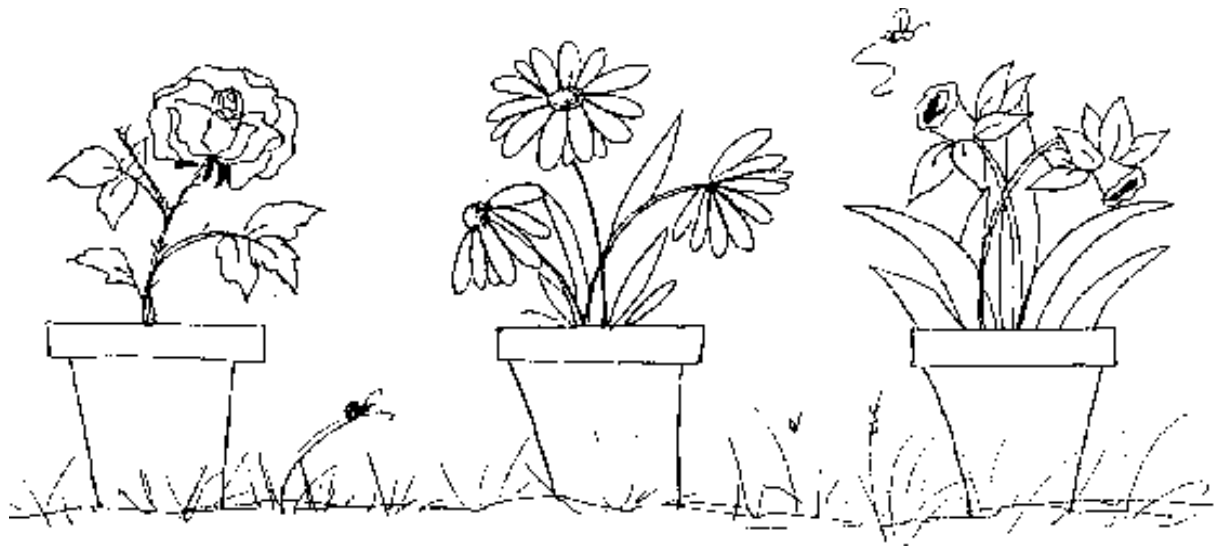
## **PROCEDURE:**

This coloring exercise is to have children look at different plants and to realize that not all plants produce flowers.

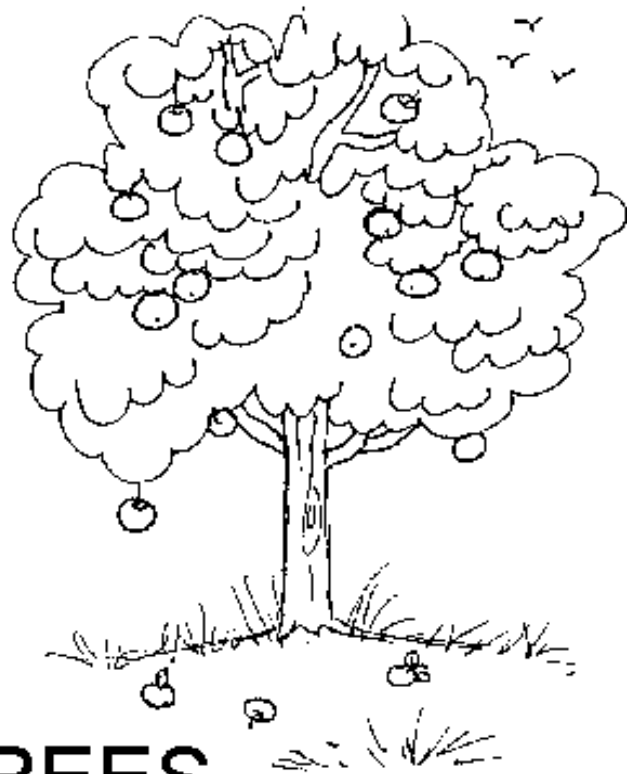
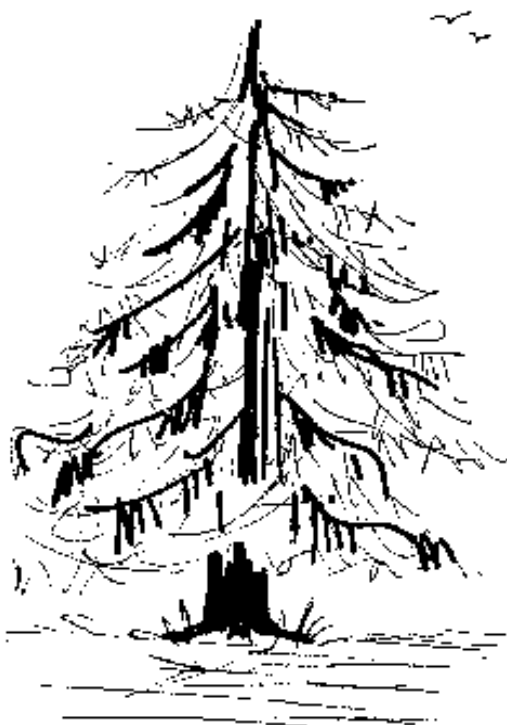
1. There are many different types of plants. Instruct your students to color the rose, daisy, daffodil and label the flower, the stem, and the leaves. Ask them why flowers are important to plants. Flowers produce seeds which help the plant reproduce. Do all plants have flowers? Ferns and many other types of plants do not have flowers. They reproduce by other methods which produce spores.

2. Do all trees have flowers? Trees like apple trees do have flowers, but later produce the fruit that contains the seeds. Pine trees do not have flowers. They do, however, some have cones that contain the seeds that will help make new plants.

3. What is the difference between plants and all other organisms? Plants produce their own food by a process called photosynthesis. The color green is associated with the plant being able to produce its own food.



# 1. FLOWERS



# 2. TREES