BIOLOGY OF PLANTS

HOW PLANTS GROW Activities

Looking Inside a Seed

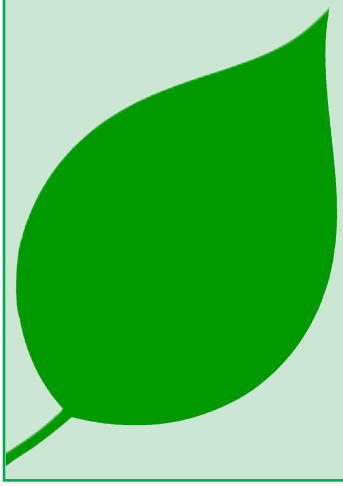
Students will take apart a seed, examine, and identify its parts.

Materials:

1. Lima beans
2. Shallow container for soaking seeds
3. Hand lenses

Preparation:

1. Soak the seeds over-night in about one inch of water.
2. Drain off the water.
3. If you forget to soak the seeds, microwave them in water on medium for 10-15 minutes. Remove seeds when coats begin to split. Cool seeds thouroughly before using them.



Procedure:

1. Tell students that every seed contains a new plant and a food source to keep that plant alive until it is big enough to make its own food. Explain that we will see both the new plant and the food today. Pass out seeds to each student.
2. Have students pull off the loosened seed coat. Ask what the coat does for the seed. (It protects the new plant from cold or wet or from drying out before it is ready to grow.)
3. Carefully split the seed in two from the side AWAY from the indentation. It will split open like a book. Opening the two halves of the seed exposes the embryo. Have students find the plant's leaves and roots.
4. Ask what all the rest of the material in the seed is. (Food for the new plant—and the food store is larger than the small plant.
5. Have students draw the seed parts they have seen.

BIOLOGY OF PLANTS

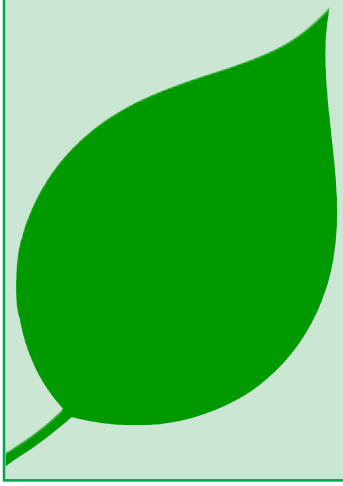
HOW PLANTS GROW Activities

Conditions for Germination (Ziploc Bag Method)

Students will experiment to see which conditions favor germination of seeds.

Materials:

1. 4 ziploc bags for each group of students
2. 4 paper towels for each group of students
3. 12 seeds all the same kind for each group (mung bean, lima bean, alfalfa, or radish)
4. 4 label for each group
5. Markers
6. Water



Procedure:

1. List ideas about what people need to grow healthy and strong. Ask what plants need to grow. What do seeds need to grow? (It is likely that their answer for seeds will be the same as for plants—water, sunlight, air, soil). Explain that the class will do an experiment together to find out what seeds need to grow.
2. Give each group of experimenters bags, labels, and markers. Have them write their group's name on all the labels. Number the labels 1 through 4. Place one label on each bag.
3. Give each group paper towels. Have them fold the paper towels in fourths.
4. Wet three of the towels. Place them in bags 1 through 3. Place the dry towel in bag 4.
5. Add three seeds to each bag.
6. Discuss where seeds can be put to receive sunlight and no sunlight. Also select a cold, dark spot where some seeds can be placed.
7. Place bag 1 in the sun. Place bag 2 in the dark. Place bag 3 in the cold, dark place. Place bag 4 in the sun.
8. Check on the seeds in 4–5 days. Make a chart to record your results.

BIOLOGY OF PLANTS

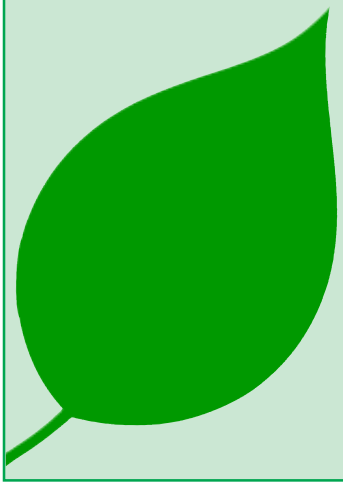
HOW PLANTS GROW Activities

Conditions for Germination (Plastic Pot Method)

Students will experiment to see which conditions favor germination of seeds.

Materials:

1. 4 two-inch plastic pots for each group
2. Potting soil
3. 12 seeds all the same kind for each group (mung bean, lima bean, alfalfa, or radish)
4. 4 label for each group
5. Markers
6. Water



Procedure:

1. List ideas about what people need to grow healthy and strong. Ask what plants need to grow. What do seeds need to grow? (It is likely that their answer for seeds will be the same as for plants—water, sunlight, air, soil). Explain that the class will do an experiment together to find out what seeds need to grow.
2. Give each group labels, pots, and markers. Write group's name on all labels. Number the labels 1 through 4. Place one on each pot.
3. Place potting soil in each pot to within one inch of top.
4. Water pots 1, 2, and 3. Leave pot 4 dry.
5. Place 3 seeds on top of soil in each pot. Make sure that each of the pots which is watered remains damp throughout the experiment. When seeds dry up after being moistened, the new plant dies.
6. Discuss where seeds can be put to receive sunlight and no sunlight. Also select a cold, dark spot where some seeds can be placed.
7. Place pot 1 in the sun. Place pot 2 in the dark. Place pot 3 in the cold, dark place. Place pot 4 in the sun.
8. Check on the seeds in 4–5 days. Make a chart to record your results.

BIOLOGY OF PLANTS

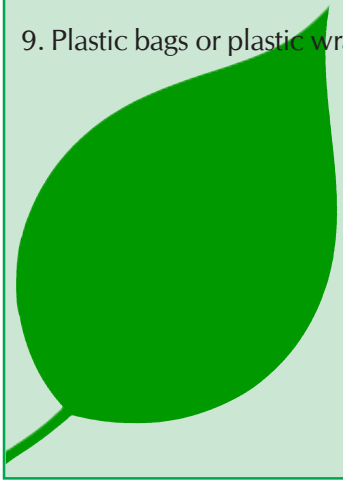
HOW PLANTS GROW Activities

Characteristics of Living Things

Students will list the characteristics of living things. Students will test plants' ability to respond to their environment.

Materials:

1. Collection of objects from the room including a plant and an insect.
2. *Mimosa pudica* plant (also called sensitive plant)– (available through Carolina Biological Supply Company: 800-334-5551 or www.carolina.com)
3. Lima beans for each child, soaked overnight
4. Pins
5. Corrugated cardboard, cut in small squares (1 per student)
6. Paper towel for each child
7. Water
8. Clothesline and clothes-pins (paper clips can be substituted)
9. Plastic bags or plastic wrap



Procedure:

1. Present the collection of living and non-living objects to your students. Ask how we would know that each of these objects is a living thing, or a non-living thing. List the characteristics that all agree fit living things, and non-living things.

   (One characteristic which may not show up on their list is that all living things react to their environment. Be sure that this is included at least tenetively, and discuss whether plants fit this criterion.) Accept all opinions and explain that we can test whether plants respond to touch and gravity.

2. Touch: Bring out a mimosa plant. Ask a student to touch its leaves. What happens? (The leaves will fold together.) Explain that plants can move although they cannot uproot themselves and move to another place.

3. Gravity: Have each child place a dampened paper towel on corrugated cardboard. Label the four sides of the cardboard square 1 through 4.

4. Pin a lima bean to the cardboard (pin through the fat center of the seed). Place the cardboard in a plastic bag or wrap in plastic wrap. Hang the cardboard on clothesline with side 1 up.

5. When most of the lima beans have germinated, check to see which way the roots and top of the plant are growing.

6. Turn the plant so #2 is up. Check two days later. What has happened? Repeat, turning to side 3 and side 4.

7. Talk about the ways the seedling and the mimosa plant reacted. Reinforce that all living things, including plants, react to their environment, although some of the reactions are very slow.

BIOLOGY OF PLANTS

HOW PLANTS LIVE IN DIFFERENT PLACES Activities

Where Do I Belong?

Students classify pictures of habitats as deserts, tropical rain forests, or other areas.

Materials:

1. 3 large drawings of thermometers
2. 1 very large raindrop cut-out
3. 1 very small raindrop cut-out
4. 3 large sun cut-outs (place screen or cello phane over one of them)
5. Pictures of desert scenery
6. Pictures of tropical rain forest scenery
7. Pictures or examples of desert plants
8. Pictures or examples of tropical rain forest plants

Procedure:

1. Discuss different habitats, especially the desert and tropical rain forest habitats*. Help students identify desert with a hot, dry, sunny place. Help students identify tropical rain forest as a warm, wet, shady place.
2. Classify the area you live.
3. Post cut-outs and drawings for each habitat:

   Desert: Sun, thermometer with very high temperature, small raindrop

   Tropical Rain Forest: Sun with screen, thermometer with warm temperature, large raindrop

   Your Habitat: Sun (screened, covered, or full), thermometer (both hot and cold, if you have seasons), raindrop of appropriate size
4. For very young children: Provide children with pictures of local, desert, and tropical rain forest habitats and plants. Ask students to separate them by the the places they come from. Create a bulletin board panel for each habitat.

   For older children: Ask the students to bring in or cut out pictures of the three habitat and plant types. Identify the location of each. Create a collage for one of the habitats.

** Other habitats, such as grasslands or tundra, may also be included.*

BIOLOGY OF PLANTS

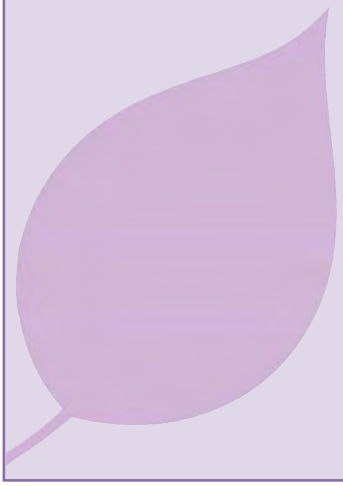
HOW PLANTS LIVE IN DIFFERENT PLACES Activities

Water Out

Students will observe water loss through leaves (transpiration).

Materials (for each group):

1. Two living plants of the same type (using *Pothos* or *Dracaena* is best).
2. Silk/plastic plant similar to living plants (put in pot with soil)
3. Plastic bags (produce bags may work well)
4. Rubber bands or long twist ties
5. Petroleum jelly



Procedure:

1. Discuss how plants get water. Ask if any of the students might know how plants lose water. Remind students that carbon dioxide goes into plants through holes in the leaf surface. Plants also give off oxygen through these same holes. If the idea is not suggested, ask the students if water might evaporate from the leaves through the same holes.
2. Give each group their 2 living plants and 1 silk/plastic plant.
3. Have students put petroleum jelly on the bottom of all of the leaves on one of their living plants (this will cover most of the stomates). Have the students water all three plants well--but do not make the soil sopping wet. Cover each of the plants with a plastic bag. Secureit to the base of the stem, or the pot, with rubber bands or long twist ties.
5. Observe all three plants in 2–3 days. What has happened? Ask where the water went.
6. Make a chart to show results:

	Water on bag (Y/N)	Soil (wet/dry)
Living plant without jelly		
Living plants with jelly		
Artificial plant		

The silk plant has no roots to carry water to leaves--its soil will be very damp. The plant with no jelly on its leaves should have droplets of transpired water on the inside of the bag. The plant with jelly on its leaves should have no water on bag, but soil may be drier than the artificial plant.

8. Discuss with students how the water got on the bag. How did it come out of the plant? Point out that the one with jelly came out differently. What does that suggest?
9. Extension: Coat the bottom of several leaves with fingernail polish. When dry, peel this off and look at underside of leaf with a hand lens or microscope to see the holes (stomates) where water and gases are lost. Compare to a leaf that has not been coated with polish.

BIOLOGY OF PLANTS

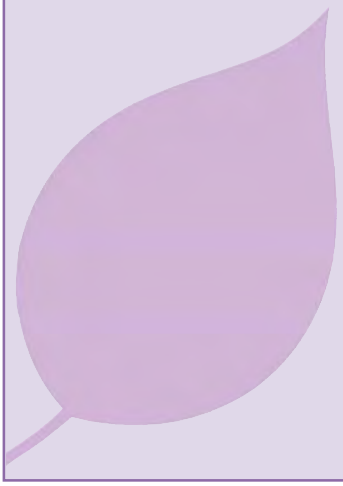
HOW PLANTS LIVE IN DIFFERENT PLACES Activities

Water Loss and Leaf Structure

Students will explore the roles of succulence and tough outer coverings in preventing water loss. Students will infer that leaves like these help plants survive in dry places.

Materials (for each group):

1. 3 sponges (4¾ x 3 x 1 1/16)
2. 1 sponge (4¾ x 3 x 1½)
3. 1 plastic bag
4. 2 dishes large enough to hold sponges
5. 2 measuring cups or graduated cylinders
6. Water



Procedure for Succulence:

1. Give each group one large and one small sponge. Have them put each sponge in a dish. Have students pour equal amounts of water over each sponge. Allow the sponges to sit in the water for a minute or so.
2. Have students squeeze the thin sponge into a cup. How much did it hold? Repeat with the thicker sponge. Put the measuring cups next to each other. Which one has more water? (Older children can subtract to measure how much more the thick sponge holds.) Which sponge will dry out faster?
3. Remind the class that some plants live in places with lots of water, while others live in places with very little water. Where would thick leaves be better? Thin leaves? Why? Thick leaves like thick sponges can hold a large amount of water. In places where rain falls infrequently, plants with thick, sponge-like succulent leaves survive the droughts.

Procedure for Leaf Coverings:

1. Give each group two thin dry sponges. Place each in a dish. Pour 250 mL of water over each sponge. Allow the sponges to sit in the water for a minute or so.
2. Have students carefully place one sponge in a plastic bag.
3. Now squeeze each sponge over measuring cups. Compare the amount of water which comes out.
4. Which is a better way to keep water in the sponge? In this demonstration, the bag acts like a tough waxy outer coating on a leaf, keeping moisture inside. Discuss the role of leaf shape and covering in keeping plants from loosing water in dry places.

BIOLOGY OF PLANTS

HOW PLANTS LIVE IN DIFFERENT PLACES Activities

Water Loss and Leaf Shape

Students will observe that leaf shape and coating can increase runoff of extra water. Students will infer that leaves which shed water quickly keep plants healthy in very damp climates.

Materials:

1. Leaf patterns (next page)
2. Scissors
3. Construction paper
4. Wax paper
5. Water mister

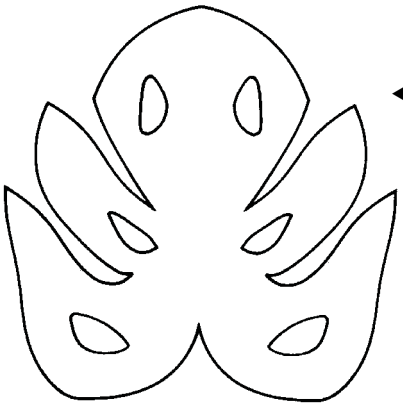
Procedure:

1. Talk with class about the shapes of leaves they see around their school and home. (You might have them bring in samples.) Is the shape of a leaf important? Discuss reasons leaf shape may or may not be important for the survival of the plant. Suggest that they can find out by an experiment.
2. Trace the leaf patterns on the following pages so your students can use them.
3. Have each group of students cut out a set of patterns in both construction and waxed paper. (You may also have them use some large leaves found in your area as patterns.)
4. Have students work first with the construction paper leaves. Mist each with water and observe which one sheds water best. Compare results. (The heart-shaped drip-tip, pleated fan-shape, fern, and split-shaped leaves should do the best.)
5. Repeat with wax paper leaves to compare with the construction paper ones. (The waxed coating should help leaves shed water.)
6. Ask the students how leaves that shed water well might help plants in wet places survive? (Leaves which shed water and dry quickly would be less likely to mold or mildew or be settled by small plants.)

Note: As we have seen in this activity and the previous one, waxy coatings can be beneficial for both desert and rain forest plants. In the desert, a waxy coating keeps moisture in the plant; in the rain forest, a waxy coating repels moisture which would otherwise damage the plant.

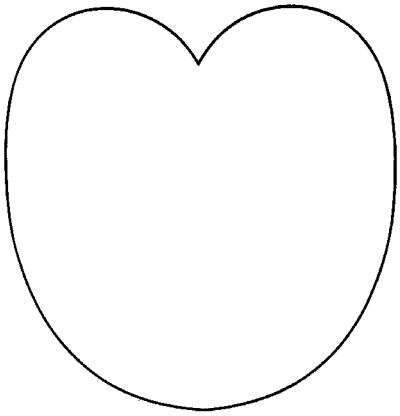
Water Loss and Leaf Shape—continued

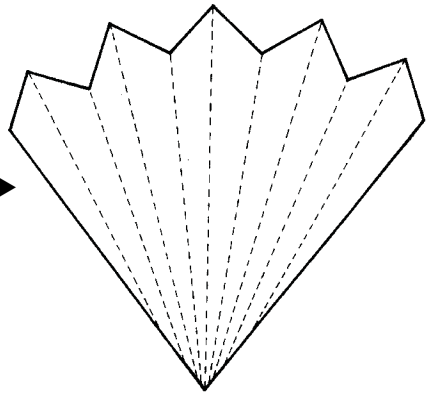
LEAF PATTERNS



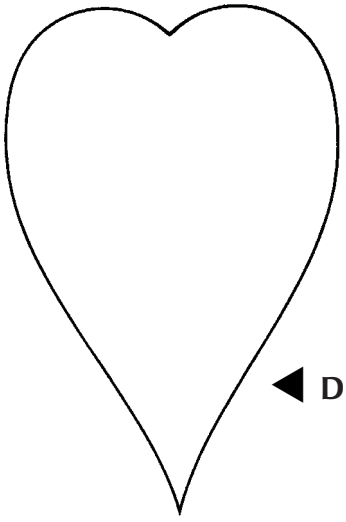
Split Leaf
(Cut out holes)

Large Round Leaf





Fan-shaped Palm
(Cut out and pleat along the dotted lines)



Drip-tip Leaf

Fern
(Fold paper in half and cut on the fold for a two-sided fern)

BIOLOGY OF PLANTS

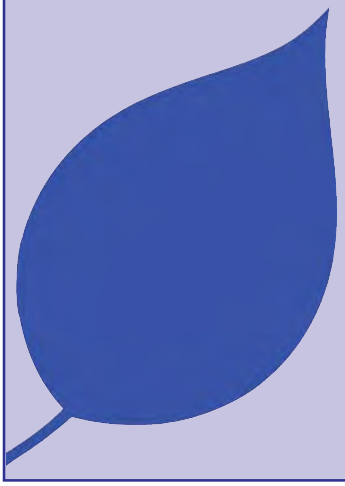
WHAT IS POLLINATION? (A STICKY QUESTION) Activities

Create a Flower

Students apply what they have learned about flower shape and structure to create flower models.

Materials:

1. Construction paper
2. Colored cellophane or tissue paper
3. Nut cups (portion cups)
4. Paper strips or pipe cleaners
5. String
6. Stapler
7. Hole punch
8. Crayons or markers



Preparation:

1. Assemble one flower of each type before class:

   a. Hummingbird: Make a tube from orange or red construction paper. Students may fringe the end of their tubular flower. Have them insert one straw or pipe cleaner (pistil) and 2–5 pipe cleaners or paper strips (stamens). Staple the base of the flower closed.

   b. Insect: Have white, pale pink, pale blue, and pale yellow paper available. Cut out a five-petalled shape around a circular center. Students may draw bee guides on petals leading to the center. Punch one hole in center. Put one pipe cleaner or paper strip and two or three doubled pipe cleaners through hole for pistil and stamens.

   c. Wind-pollinated flower: Color nut or portion cup green, brown, or pale pink. Punch a hole in base of cup. Cut two pieces of string about 8" long. Knot them together in the center. Pull the knot in the string and one end of a pipe cleaner throught the base of the cup, leaving the long stamens and pistil sticking out of flower. Fasten.

Procedure:

1. Show your class the model flowers. Review with the class the features of flowers pollinated by insects, birds, and wind. Which of the flowers is pollinated in each way? Tell them that today they will have a chance to make a flower pollinated in one of these three ways.
2. Have class make their flowers without patterns.
3. Display the flowers, labelling each flower with its pollinator's name.

BIOLOGY OF PLANTS

WHAT IS POLLINATION? (A STICKY QUESTION) Activities

Hand Pollination

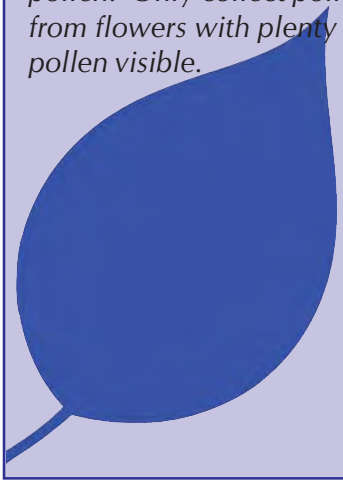
Students will transfer pollen from flowers on one plant to another. Students will observe the formation of seeds in the pollinated flowers.

Materials:

1. Readily available potted flowers for each group (such as amaryllis, tulips, gloxinia, gladiolas, lilies; all groups must have the same type of plant)
2. Pencils with good erasers or paintbrushes
3. Labels
4. Marker for labels

Note:

Purchase plants a day or two before the activity. Purchase plants with some blossoms open, with pollen visible on stamens. Keep the plants in appropriate light to ensure that you will have many blossoms with pollen. Only collect pollen from flowers with plenty of pollen visible.



Procedure:

1. Introduce the activity by reviewing the parts of the flower involved in pollinating using a model or cut flowers. Then explain that the class will pollinate flowers.
2. As you demonstrate how to pollinate the flowers, ask students: Where do pollinators collect pollen? (From the stamen.) Use your pencil's eraser to collect pollen from the stamen. Hold it in the air and ask: Where do pollinators deliver pollen? (To the pistil.) Gently roll your eraser across the pistil to deposit the pollen.
3. Have only one student in each group collect pollen at a time. Then have the pollinator walk to the next group's flower to deposit it. Repeat until all students have had a chance to pollinate a flower.
4. Label each group's pot with their names. Continue to care for the plant for the next two to three weeks. Watch what happens to the flowers which gave and received pollen.

   The seeds which your flowers produce may not be fertile. Hybrids are frequently unable to produce viable seed. If you want your students to follow the whole life cycle, ask a good nurseryman about your plants before buying them.

BIOLOGY OF PLANTS

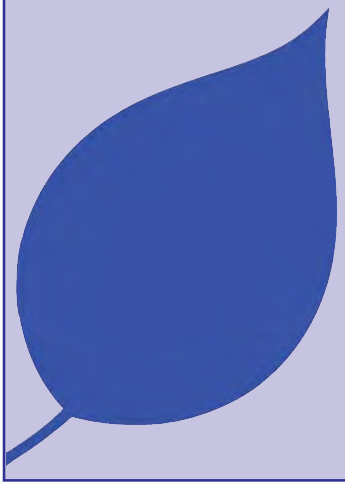
WHAT IS POLLINATION? (A STICKY QUESTION) Activities

Petal/Pollinator Sort

Students will classify flowers by the types of pollinators they would attract.

Materials:

1. Flowers growing in a garden or cut flowers such as gladiolas, freesia, lilies, tulips, petunias, gloxinia, honeysuckle
2. Paper and pencil for notes
3. Hand lenses



Preparation:

This activity will work best in late spring, when some grasses or trees are also in flower. Scout the area before your group visits to assure that there are some insect- and bird-pollinated flowers in blom as well as wind-pollinated ones.

Procedure:

1. Introduce the activity by reviewing pollinators and flower structure with students. Which kinds of flowers do insects visit? Birds? Which kinds use wind for pollination? Announce that they will look for flowers for each type of pollinator.
2. Equip each student with hand lens, paper, and pencil.
3. Explain that they may look at any flowers in the area. For each flower students visit, they will inspect and record: the scent/absence of scent; the color of the flower; the shape of the flower; the identity of any animals on the flower. Demonstrate how to record the information for one flower.
4. After all the students have recorded information on at least 5 flowers, assemble the group and share your results. Predict what will pollinate each of the flowers. Go back and watch for pollinators (at least 15 feet away if you seek birds).
5. If you cannot visit a garden, you can bring some cut flowers into the classroom. Some florists give teachers left over cut flowers that they did not sell.

BIOLOGY OF PLANTS

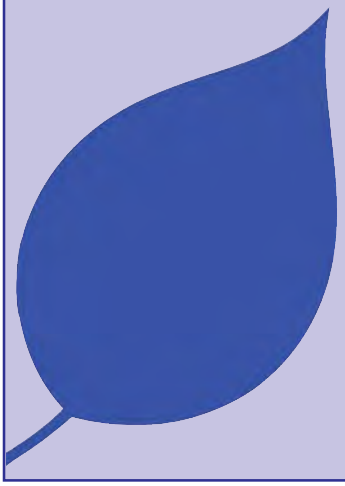
WHAT IS POLLINATION? (A STICKY QUESTION) Activities

Floral Diversity

Students will count flower parts and use these to classify flowers.

Materials:

1. Cut flowers such as gladiolas, freesia, lilies, tulips, petunias, gloxinia, honeysuckle (Need at least 6 different kinds)
2. Paper and pencils
3. Hand lenses



Procedure:

1. Introduce the activity by reviewing the parts of a flower. Where are the petals? Where are the stamens? What is in the center of the flower?
2. Discuss the great variety of flowers. One way botanists can separate them is by the number of parts they have.
3. Equip each student with hand lens, paper, and pencil.
4. Have students work in small groups. Give each group one flower to examine at a time. As the sutdents count and observe parts, have them record observations: number of stamens, number of petals, number of pistils, symmetry/asymmetry of flower. Give each group enough time to look at three or four flowers of different kinds.
5. Collect the class. Record the information from all the flowers on the board. Then sort the flowers by the number of petals. Sort by the number of staments within the group with the same number of petals. Do these flowers look the same in other ways? What ways?
6. It is not important for students to learn the names of the families in which we classify flowers at this point. Your students may be able to sort flowers into groups with: parts in multiples of 3, parts in multiples of 4 or 5; composite flowers with ray and disk flowers on the head; asymmetrical flowers.

BIOLOGY OF PLANTS

HOW SEEDS GET HERE…AND THERE Activities

Seed Collection

Students will assemble a set of seeds from a variety of plants for use in other activities.

Materials:

1. Paper bags for collecting
2. Small squares of paper or stick-on notes
3. Pencils

Procedure:

1. This activity is best for late spring and early fall. Look for seeds two to four weeks after periods in which many plants have flowered. If there is a park or a weedy lot near your school, the class may do this as a group. Take a small paper bag for each child.
2. Before you go, set guidelines to protect the plants you will see: Any seed on the ground or in a puddle may be col lected. Seeds from plants which are still flowering should be left behind. Leave some seeds on each plant. Ask for help if the seeds are too high to reach without climbing.
3. If students know the name of the plant from which the seeds are taken, have them write it on a note sheet to keep with their seed. If not, have them sketch the plant or write a few notes on how the plant looks (tall grass, tree with big leaves with many parts, bush with skinny long leaves). This may help identify the seeds later.
4. If there is no appropriate place to look together, encourage your students to collect seeds near their home over a period of ten to fourteen days. Remind them that there may be seeds in weedy lots or cracks in the sidewalk as well as in yards. Encourage them to make notes on where they find the seeds.
5. Set up a display in the classroom of all the seeds. Use them for the later activities.

BIOLOGY OF PLANTS

HOW SEEDS GET HERE…AND THERE Activities

The Seed Sort

Students will examine seeds and predict the means of dispersal used by them. Students will test some of their predictions.

Materials:

1. Wind-borne seeds (maple, cottonwood, dandelion, milkweed, thistle, linden, elm, ash, goldenrod, clematis, cattails, pussy willow, etc.)
2. Seeds that float (coconut, milkweed, pussy willow, etc.)
3. Seeds that stick to animals (broad-leaved plantain, cockleburs, tick seeds, burdock, etc.)
4. Seeds that are eaten (acorns, dogwood, elderberry, seeds of fleshy fruit, etc.)
5. Other seeds you find
6. Small fan
7. Towels or washcloths
8. Basin of water

Procedure:

1. Set up a display of the seeds. Divide them into sets which contain some from each dispersal method. Number each seed sample.
2. With the class, make a list of the ways in which seeds disperse.
3. Have students work in groups to examine a set of seeds. Ask each groupto record a description of the seed (flat, winged, hairy, heavy, thorny, etc.) and their prediction of the way it travels from one place to another (wind, water, sticks, eaten, other).
4. Ask the students how they could find our which of these methods the seeds actually use. Conduct the tests they suggest. Some possible tests:

Dispersal method:	Test:
Wind-borne	Drop seed near a fan. Does it blow or fall?
Sticks to animals	Place seed on a terry cloth towel. Does it stick?
Eaten by animals	Watch the plant where the seeds are found to see whether any animals eat the seeds.
Floaters	Drop the seed in water. Does it float?

5. For those which do not behave as predicted, students may try a second test.

BIOLOGY OF PLANTS

HOW SEEDS GET HERE…AND THERE Activities

The Seed Chase

Students investigate which seed structures give seeds the ability to soar the furthest.

Materials:

1. Wind-borne seeds such as maple, ash, elm, clematis, cattail, thistle, pussy willow
2. Other obviously NOT wind-borne seeds such as acorns, tickseed, dog wood
3. Standing fan, or a windy day
4. 4″ x 6″ cards for labelling endpoints
5. Markers
6. Measuring tape (25′)

Procedure:

1. Remind the students taht many seeds travel on the wind. Explain that you will have a seed chase today. Each student may select one seed to test against all the others. Encourage students to pick the seed they think will travel the furthest.
2. Select an open traffic-free area to hold your chase. Clearly mark the starting line.
3. Have students work in pairs. Have one student toss a seed into the air. Have the partner follow the seed and put a label with the child's name on it on the ground where the seed falls. Collect the seed to use in discussion later. Repeat until all students have participated.
4. Older children: Measure the distance from the starting point to the landing point. Compare distances.

   Younger children: Walk together to the three or four labels that are furthest from the starting line.
5. Compare the seeds which travelled furthest to those which travelled the shortest distance. Are they similar? What shapes and parts help seeds travel on the wind?

BIOLOGY OF PLANTS

HOW SEEDS GET HERE…AND THERE Activities

Build a Seed

Students will apply what they have learned about seed dispersal to create seeds with structures that suit them for dispersal in several ways.

Materials:

1. Pictures of seeds that travel by water, air, sticking to animals, and being eaten
2. Empty soda cans, egg cartons, spools, other containers
3. Cardboard, construction paper, cellophane
4. Wax paper, plastic bags, scraps of nylon, other water-resistant material
5. Pipe cleaners, straws, toothpicks
6. Glue
7. Scissors
8. String
9. Balloons
10. Magnets, beads
11. 5″ x 8″ cards
12. Markers

Procedure:

1. List 8–10 imaginary or real means of dispersal for seeds. Write each on a card. Make duplicate sets of cards as needed. You might include seeds that:

   tumble over the ground
   pop out of a hole in the plant
   dig themselves into the ground
   are carried by cars or bicycles
   keep the new plant dry
   are carried by fish

2. Talk with students about the ways we can tell how a seed moves from place to place. Use pictures or actual seeds to remind them that wind-borne seeds are light and stream lined or parachute-like; seeds that animals eat usually have a fleshy fruit around them.

3. Then challenge them to make their own seed. Give each child a card describing the way their seed travels. Encourage them to use any of the materials which have been set out. Allow 30–45 minutes for seed-making.

The best time to plant a tree
was twenty years ago.
The second best time is now.
ANONYMOUS

Tree Planting Tips

Why Plant Trees?

Tree planting is the most popular Earth Day event and one of the most common activities people associate with helping the Earth. Millions of trees are planted by Canadians each year. Planting is an act of putting down roots and contributing to the future. The simple act of planting a tree, helps the environment in so many ways.

Trees…

- filter pollution from the air
- help recycle water
- prevent soil loss
- create shade
- give shelter from wind and rain
- provide homes for animals
- make food for humans and wildlife
- provide an interesting, soothing, learning environment for children and your community
- and much more!

Without trees, there would be no life on this planet!

Getting Started - Tree Planting Basics

Plan Ahead, Define Objectives And Set Goals

Decide why you want to plant trees (what you hope to accomplish) and who you want/need to include in your project. Get ***everyone*** involved from the outset. Establish your short-and long-term objectives. Fundraise!

Select A Suitable Location

Test the soil. Some trees grow better in dry, sandy soils and others grow better in wet soil. Every kind of tree has its own needs. Check the soil's pH, salinity, nutrients, etc.

Make A Map

Draw a map of your site, indicating where the trees will be planted. Ask a landscape architect or forester to help you design an ideal project plan for your site.

Select Tree Species

- Choose trees that like the soil and moisture conditions of your site (this will reduce maintenance tasks, such as extra watering and fertilizing).
- Pick species that are **native** to your area, as these are best adapted to the local climate and soil conditions, flourish without chemical applications, provide food and shelter to local wildlife and represent part of your natural heritage and biodiversity.
- Coniferous trees are generally recommended over deciduous trees, as they have a better chance of surviving and require less care.
- Although young trees with established root systems stand a better chance of survival, seedlings and small shrubs are easier for kids to plant. Proper handling and planting of seedlings should be discussed beforehand.

Choose A Planting Date And Get Insurance

You must have insurance in case of an accident.

Prepare Your Site

You may need to clean up the site, dig up the soil, cut the grass, pull weeds, mark the zone(s) where trees are to be planted, or do other things to get the area ready for the big tree planting day.

Tree Planting Day

Be Sure To Have The Essentials

- **Shovels** to dig holes and **buckets** to carry trees and water.
- Proper **footwear** (avoid sandals) and **clothing** (long pants, short-sleeved shirt, sweater and raincoat, hat and work gloves) and **sunscreen**.
- **Nourishment** (a full day's work requires a hearty lunch and lots of cold drinks).
- **Shelter** to protect people and equipment from rain or hot sun.
- Washroom facilities.

Be Good Tree Planters

TAKE YOUR TIME. Don't rush to plant hundreds of trees. It is better to make sure that a few trees are planted carefully and are well-cared for. Start small and manageable and grow in stages.

Have Fun!

Enjoy your site—now and in the future. Gradually transform the ugly, barren, unused asphalt sprawl of your school ground (or community area) into a place of beauty, inspiration and education. Enhance your students' learning experience by incorporating your green, ecological outdoor classroom into all subjects of your school's curriculum.

How To Plant Seedlings

- Dig a hole wide and deep enough to cover the root system.
- Handle seedlings by the base of the stem, taking care not to bruise the bark.
- Lay the roots straight down the hole in a natural arrangement. Do not bunch, spiral, double-over or bend roots.
- Keep stones and twigs out of the hole (they create air pockets that dry out roots).
- Plant seedlings slightly above the root collar swelling.
- Cover with soil. Do not bury live branches or foliage, or leave any roots exposed to the air.
- Tamp soil firmly with toe (not the heel) to remove air pockets.
- Create a mulched area around the tree that is 50 percent larger than the spread of the branches and five to 10 centimetres deep. Wood chips or shredded pine or cedar bark are great mulch, as are oak leaves and pine needles.

Caring For Your Trees

Baby trees need to be looked after for three to five years after planting. Growing trees require nutrients, water, sunlight and room to grow. You can help by watering, weeding, adding compost to the soil and mulch to the tree bases, and by protecting the trees from animals and the weather. Create a schedule of planting and maintenance tasks (schools especially, need to incorporate summer stewardship tasks).

Projects And Activities

Starting Your Garden Plants from Seed

By Miriam Goldberger, president and native plant expert, Wildflower Farm **www.wildflowerfarm.com** , your wildflower source.

1. Helps your garden get a head start.
2. Saves money over buying "already grown" plants.
3. Makes a great in-class project.

Starting plants from seed is a very gratifying experience, one that is not as difficult as many people think. Unless you are planting a wildflower meadow, I recommend that you start your seeds indoors. This allows the seeds the best conditions in which to germinate and removes the possibility of competition from weeds. Most people do not have a greenhouse, but almost everyone has a sunny window ledge that can provide an ideal space to start your seeds.

It's best to sow the seeds in a sterile, soil-less mix you can purchase at your local garden centre. As a rule of thumb, plant the seeds at a depth of twice the diameter of the seed. Some seeds, however, require light to germinate and should be placed on the surface of the soil mix. Keep the soil moist but not wet, and never allow it to dry out. A hand-held mist sprayer is ideal for this. Almost all seeds will germinate at average household temperatures of 18-21°C (65-70°F). You'll need to exercise some patience as some seeds will germinate within a few days while others may take a few weeks.

For other tree-/forest-related activities, check out the other printable PDFs in the Science & Nature section http://www.ecokidsonline.com/pub/fun_n_games/printables/activities/index.cfm.

Or http://www.ecokidsonline.com/pub/eco_info/topics/forests/index.cfm for information about forests and trees.

Possible Funding Sources For School Ground And Community Planting Projects

Td Friends Of The Environment Foundation

Provides assistance to communities, organizations and individuals involved in establishing environmental programs. Visit the branch nearest you for an application form, or http://www.fef.ca for more information and an online form.

Canadian Tire Community Environmental Awards

Encourages associate store employees to sponsor applications initiated by schools, community groups and non-profit organizations. Contact your local store's branch manager for an application form or visit www.canadiantire.ca for more information.

Mountain Equipment Co-Op

Provides information on how to apply for regional funding and on the types of projects that have been funded in the past (log onto www.mec.ca **and look for the MEC Community link for more information).** Contact your local store for a funding application.

Tree Plan Canada

Offers funding and/or technical expertise to planting groups (www.treecanada.ca).

Your Own Fundraising Initiatives

• Create fundraising projects to generate funds and solicit financial support. Be sure to offer promotional benefits to donors.
• Contact local businesses to sponsor part of your forest. Provide them with a plaque on the forest grounds recognizing their contribution.
• Contact your local nursery for donations of seedlings or mature trees.
• Ask your local government about what resources and funding grants they have available for community tree planting projects.
• Visit your local philanthropy centre to peruse the directory of foundations to discover the ones that fund community planting projects.
• Encourage each student/family to contribute to the forest by buying one seedling. Each seedling can be tagged with the donor family's name.

Other Tree Planting Resources

Greening Canada: A Guide to Community Tree Planting
The Conservation Council of Ontario © 1994 Supply and Services Canada.
ISBN 0-662-22122-2.

The Simple Act of Planting A Tree: Healing Your Neighborhood, Your City, and Your World. © 1990 TreePeople with Andy and Katie Lipkis. ISBN 0-87477-602-3.

American Forests web site.
http://www.americanforests.org/resources/howtoplanttrees/

School Ground Transformation Resources

Greening School Grounds: Creating Habitats for Learning
Edited by Tim Grant and Gail Littlejohn © 2001 Green Teacher/New Society, Toronto
www.greenteacher.com

All Hands in the Dirt: A Guide to Designing and Creating Natural School Grounds
© 2000 Evergreen. ISBN 0-9681078-3-4 www.evergreen.ca

Canadian Biodiversity Institute's School Ground Transformation web site at www.schoolgrounds.ca.