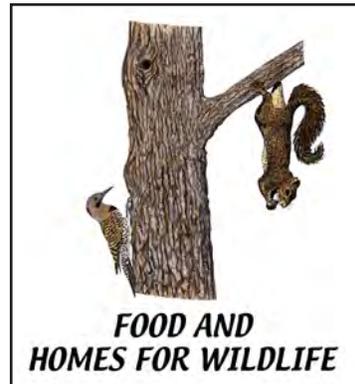


TREES

FOR KIDS

The
Values
Of



*Iowa's Trees
and Forests*



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Trees For Kids 2005

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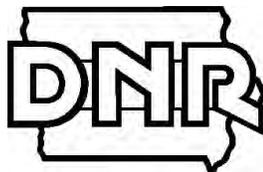
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TREES FOR KIDS

The Program

Trees For Kids/Teens is a tree education and planting program that targets Iowa's elementary and secondary school students. Its goals are to educate students about the values of trees and to encourage tree planting projects at schools or other public areas around the state of Iowa. In 2004 over 12,000 teachers and their students were involved with the *Trees For Kids/Teens* programs, planting over 100,000 trees.

This unique program is sponsored by the Iowa Department of Natural Resources (IDNR), the Iowa Nursery and Landscape Association (INLA), the Iowa Banker's Association (IBA), MidAmerican Energy, Aquila, Alliant Energy, Iowa State University Extension Forestry, the Iowa Tree Farm Committee, the USDA Forest Service, Trees Forever, the Iowa Society of American Foresters, Iowa Woodland Owners Association and the Iowa Conservation Education Council.

This teacher's packet of tree information and classroom activities is designed to complement science, reading, math, geography, computer skills, history and other subjects. Feel free to utilize any or all of the packet and/or to photocopy specific activities and lesson plans. Should you need more copies of the materials, please contact the IDNR at (515)281-4915 or download individual activities off the web at www.iowadnr.com/forestry.

The Trees

A landscape tree is available "free" to your class to plant in celebration of Iowa's Earth/Arbor Day in the spring of 2005. Contact Trees For Kids Coordinator **Megan Enneking** at (515)281-4915 or e-mail tfkids@dnr.state.ia.us (after May 15 contact John Walkowiak at john.walkowiak@dnr.state.ia.us), for the names of participating Iowa nurseries (INLA members) who will sell trees at reduced or wholesale costs to participating Trees For Kids teachers. Megan will also give you local funding source contacts from the Iowa Bankers Association (IBA) and local Tree Committees who will assist you in getting the remaining funds to pay for your trees. In the end, there is no cost to your school!

We suggest that you do the following in preparation for planting your tree. Discuss planting trees with your principal and grounds keeper, locate a site, and contact a local INLA nursery. Next, contact a funding source at your local IBA bank or Tree Committee and explain that you are working on a Trees For Kids project for Earth Week/Arbor Day 2005 that needs funding. When sponsors agree to fund the project, have the nursery bill the bank or committee directly for the tree. Once you have secured funding, make arrangements for delivery with the nursery and set a planting date. Now you're ready to plant a tree with your students!

2005

*Teaching Kids the
Value of Trees for 15
Years*



*To plant trees is to
give body and life to
one's dreams of a
better world.
~Russell Page*

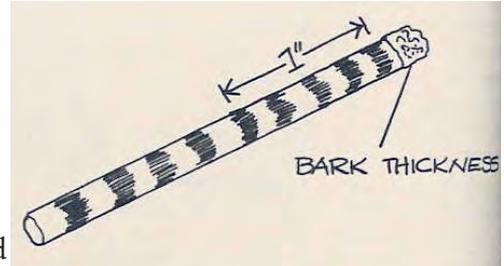


How Does a Forest Work?



The Life Cycle of Trees

Trees have life cycles, just like all living things do. They are born, grow, get injuries and disease, age and then they die. Just like humans, as trees go through their life cycle, their size and shape change, along with the role they play within the environment. In order for scientists to find out what a particular tree's life cycle has been like, they take a core sample. A core sample allows scientists to observe the growth rings in a tree that is still alive. A tree's growth rings can show things such as: the tree's growth, if it has been injured by drought, disease or fire, and the long time changes that have occurred within the tree's growing environment.



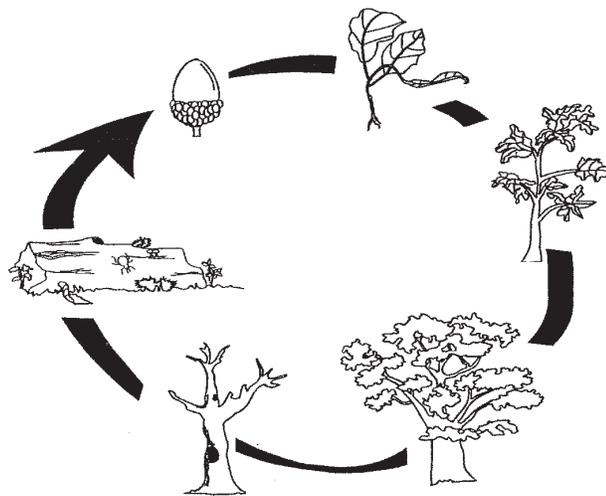
INCREMENT BORER-CORE SAMPLE
Used to remove a small core of the tree to count the rings which reveals the age of the tree.

The best way for a scientist to learn about the life cycle of trees is to watch them from the beginning. Most trees begin their life as seeds. These seeds have a long way to go from being a seed to developing into a tree. The forest environment doesn't always make it easy for seeds to survive. In order for a seed to grow into a seedling it must land in an area with favorable light, soil, temperature, moisture and nutrient conditions.

In order for this seedling to sprout and become a sapling, it must compete for sunlight, water, nutrients and other resources. Because the competition is so great, many saplings will not survive to maturity. To compensate for those saplings that will not make it, plants and trees produce far more seeds than will have even a chance at survival. Trees are considered to be mature when they can reproduce. The amount of time it takes for trees to become mature varies among species.

A seed may make it to maturity, however, that does not mean that it is in the clear. Trees, just like all living things, occasionally get injured and/or develop disease. When trees die, they fall and are then broken down by the decomposers of a forest such as insects, fungi, and bacteria. As trees decompose, they are transferring essential nutrients back into the soil to allow for future seeds to be able to prosper. This starts the tree lifecycle back in motion.

Can you label each step in the cycle?



Answers on answer page



Clean Water and Our Forests

Improving water quality is one of the main benefits trees provide. Streamside forests are vital to the protection of our streams and rivers. These forests protect the stream from nonpoint source pollution (NPS) which is water pollution that cannot be traced to a specific source.

Streamside forests can:

1. Improve the quality of water by removing the effects of pollutants in runoff.
2. Increase the biological diversity and productivity of stream communities by improving habitat and adding to the organic food base.

Streamside forests act as filters, transformers, sinks and sources:

Filter: The streamside forest is a filter because it removes sediment and sediment-attached phosphorus. The vegetation found in a forest catches the sediments before it can reach the water. Also, the soil in a forest is very porous and acts as a sponge, soaking up pollutants.

Transformer: The streamside forest is a transformer because it transforms nitrate to nitrogen gas and toxic chemicals such as pesticides are converted to non-toxic forms.

Sinks: The streamside forest acts as a sink by storing nutrients. Nutrients are picked up by plants and stored in plant tissue.

Source: The streamside forest provides a source of energy for aquatic life in the form of dissolved carbon compounds. As much as 75% of the organic food base may be supplied by these compounds, such as fruit, limbs leaves and insects that fall from the forest canopy.

By cutting down trees for agricultural purposes and urban expansion, we are negatively affecting the quality of our water. Many streams are unfit for humans to drink and even unfit for industrial use and recreational use. Shellfish and finfish production also goes down. These problems are found to be caused by contamination from nutrients, animal waste and pollutants from agriculture and urban runoff.

Establishment of new forests and maintenance of existing forests can protect and improve the quality of water before it reaches our faucet. This natural filtering or cleaning of water is accomplished a number of ways:

- The roots of woody plants such as trees and shrubs, and the deep roots of prairie grasses help stabilize streambanks. Bank stabilization reduces the amount of soil (sediment) that is lost into streams and rivers.
- The presence of woody stems above ground can slow down flood waters along streams and rivers, allowing it to be absorbed through the soil which is full of rich organic matter, reducing the amount of erosion and damage caused by these events.
- During the plant process called transpiration, trees and other vegetation utilize large amounts of water. This water contains dissolved nutrients and chemicals that are taken up by the plant. It is estimated that the vegetation can utilize thousands of gallons of water per acre each day. This drying of the soil allows it to absorb more water during runoff and flood situations, reducing the amount of material reaching streams and rivers.
- The uptake of water and nutrients by roots is improved by a specialized relationship with soil fungi called mycorrhizae. This is a symbiotic relationship (both organisms benefit) in which the tree supplies carbohydrates to the fungi, and the fungi allow the tree to be more efficient in absorbing water and nutrients.
- Tree canopy interception by leaves and branches reduce the speed and amount of rainfall hitting the ground surface. This reduces runoff and makes soil run off minimal.



"Riparian Forest Buffers." Maryland Department of Natural Resources. 14 Feb. 2005 <<http://www.dnr.state.md.us/forests/publications/buffers.html>>
"Iowa's Forests and Water Quality." Iowa Department of Natural Resources. July 2003. <<http://www.iowadnr.com/forestry/>>

Woodlands For Wildlife

Before the settlement of the European-Americans in the early 1800's, Iowa was comprised of 7 million acres of forested land. In the present day, only 2.7 million acres of forest remains. However, of this forest land, over 90% of it is privately owned. This means the majority of Iowa's forests are owned by people like your parents and grandparents.

There are many reasons to protect Iowa's forests, including preserving the beautiful scenery the forest provides and the jobs it creates to benefit the economy. Possibly one of the most important reasons to protect Iowa's forests is to protect the wildlife that live in these forests. What are the values of Iowa's forest woodlands to our native wildlife?



Values of Trees and Forests to Iowa's Wildlife:

1.) Shelter: With the typical Iowa winter of subzero temperatures and strong northerly winds, trees, especially conifers, provide critical winter cover for many of Iowa's game and non-game species. If densely planted, conifer trees act as "Wildlife Hotels" by greatly reducing wind chill temperatures and allowing wildlife to conserve body heat.



2) Protection: Conifers, among other plants and trees, provide cover for wildlife hiding from predators. Conifers ideally suited to Iowa's growing conditions include red cedar, white pine, red pine, jack pine, norway spruce and white spruce.

3) Food: Broadleaf shrubs and small trees with dense low hanging branches also provide winter cover for wildlife and provide winter food sources. Shrubs and small trees such as serviceberry, the dogwoods, chokecherry, wild plum, elderberry, arrowwood, nannyberry, buttonbush and highbush cranberry are excellent choices for Iowa wildlife. As the snow becomes deeper and blows into drifts, upright woody vegetation continues to provide winter food, browse and cover which is often critical to wildlife winter survival.



4) Safe & Healthy Environment: By maintaining the woodlands within the forests, you are also limiting soil erosion and protecting watersheds. Woodlands reduce run-off by intercepting and softening the impact of falling rain. Also the root systems of the trees stabilize soils. Streamside woodlands protect rivers and streams by absorbing excess nutrients in runoff, thereby reducing pollution in the stream and cooling water temperatures.

"Introduction to wildlife management." Iowa Wildlife Management: Iowa Association of Naturalists, 1995.



TREES Make our Cities Safer

There are many differences that exist when comparing city life to that of rural living. Cities are more crowded, noisy and bustling. Among one of the biggest and most troubling of the differences is the difference in crime rate. Numerous studies have produced statistics that show the amount of violence within a large city is substantially greater than the violence in rural areas.

Two professors, W.C. Sullivan and Frances E. Kuo, set out to determine why violence in cities is so much more prevalent. The pair decided to start by examining a public housing development called Robert Taylor Homes in Chicago. It is the largest public housing development in the entire world. The development includes twenty-eight 16 story buildings. As you can probably imagine, with all this concrete, the presence of trees and nature is scarce. However, there are a few buildings that are surrounded by trees.



*Robert Taylor
Section with trees*

The professors decided that in order to discover whether or not trees played a role in the prevalence of violence, they would study the people in the buildings that had access to trees and compare them to the people who didn't have access to trees.

The results were startling.



*Robert Taylor
Section with OUT trees*

RESULTS:

- People gathered in common spaces that contained trees significantly more often than those spaces without trees.
- Adults, children and adults supervising children all preferred the space with trees.
- Residents who live near trees have significantly less violence.
- Of 200 residents interviewed, 14% said they had hit their children in the past year. Only 3% of residents in areas with trees admitted to hitting their children.
- Also, 22% of women from non-green areas said they had engaged in violence in the last year. Only 13% of women from green or planted areas said the same thing.

CONCLUSION:

Sullivan and Kuo concluded that the presence of trees provides people a setting where they can build relationships with others, which creates less violence.

What are they saying?



"I think that through this research I have become convinced that trees are really an important part of a supportive, humane environment. Without vegetation, people are very different human beings." -Dr. Frances Kuo



"We're finding trees produce settings in which neighbors get to know each other better and violence is reduced."
-Dr. William Sullivan

Schiller, Lucy A., Shortess, John. "Chicago, The Forest Where we Live." Louisiana Public Broadcasting. 1997. 31 Jan. 2005. <http://www.lpb.org/programs/forest/chicago.html>.

Iowa's

Black Gold



One of Iowa's most valuable natural resources is the black walnut tree. The black walnut is famous world-wide for its rich chocolate brown color, quality, strength, durability and workability. The black walnut is abundant throughout the Midwest, but is especially prevalent in Iowa. Researchers found that 2 out of every 100 trees in the state of Iowa is a black walnut.

The black walnut is used for things such as: fine furniture, gun stocks, bowls and veneer. Veneer is a thin sheet of wood that can be glued to another piece of wood of lesser value, so that the wood can be purchased cheaper, while appearing to be of higher quality. Not only is the black walnut used in commercial products, it is also valuable for its edible nuts, food for wildlife, aesthetic beauty and its role in protecting the soil and water around it.



Black Walnut Tree

Fun Facts

- In the mid-1980's it was reported that someone paid \$90,000 for a single log of the black walnut tree.
- Walnuts are a major source of food for wildlife such as squirrels, white-tailed deer, and woodpeckers.
- There is a chemical called 'juglans' in the roots of the black walnut that can actually slow down or completely stop the growth of other plants and trees. It is said that the chemical is so strong that it can still affect the growth of other plants and trees even after the black walnut has been removed.
- The nuts of the black walnut tree are used in cooking baked goods and also ice cream.
- The shells of the black walnut can be used: to clean jet engines, as filler in dynamite, filter in smokestacks and agent for insecticides.

"Black Walnut." Ohio's Trees. Ohio Department of Natural Resources. 19 Jan. 2005 <<http://www.ohiodnr.com/forestry/Education/ohiotrees/walnutblack.htm>>

UNUSUAL PRODUCTS OF THE FORESTS

AROMATICS: This includes the essential oils that are extracted from plant leaves, flowers, seeds, bark, roots and the rinds of some fruits. These oils are used in cooking, potpourri, cosmetics and massage oils. Some oils are also used in insect repellent. Native red cedar oils are in demand for products such as potpourri, perfume and cleaning solvents.



BERRIES AND WILD FRUIT: Fruits and berries are a delicious product of the forest. Two of the most well known berries found in the forests are the chokecherry and black cherry. Buffaloberry, gooseberries, currants, strawberries, blackberries, elderberry and raspberries are also some of the more common berries that can be found in the forests. Some other fruits that can be found in the forests include: mayapples, pawpaws, persimmons, crabapples, Oregon grape, and different types of wild plum.



CHARCOAL: Charcoal is a fuel product that is used today mainly for restaurant and home cooking. Before modern day manufacturing came about, charcoal was produced almost exclusively in the forest in brick kilns and ovens. It is still the number one way people in developing countries cook their food.



COOKING WOOD, SMOKE WOOD AND FLAVOR WOOD: A forest's wood is valuable on many levels. Besides its obvious uses, wood is used for special purposes. Some woods such as the alder, apple, cherry, pecan and hickory, are used in cooking as natural flavor enhancers. Smoke wood refers to sawdust from the wood that is used in smoking food.



DECORATIVE WOOD: Certain types of wood are especially valuable because they are used in products for decoration. For example, only special types of wood such as basswood are used in the making of musical instruments. Other native woods such as oak, walnut, maple and cherry are used in making jewelry boxes, tabletops, gun stocks, table and floor lamps, table legs, candleholders, ashtrays, bowls, cutting boards, plaques, planters, birdhouses, carved animals, matchbox holders, ornaments and letter openers.



MEDICINE AND PHARMACEUTICALS: Forest botanicals are plants that are used for their therapeutic properties, flavor and scent. A subset of botanicals are herbs which are used in the making of teas and oils. Ginseng, another common botanical of the forest, is used as a nutritional supplement and an ingredient in skin crèmes. Ginseng is believed to improve circulation, increase energy and lessen the effects of aging. The bark of the white oak is used as a pharmaceutical to treat burns and mouth sores. There are hundreds of native plants that are used in medicine.



HONEY, MUSHROOMS, NUTS AND SYRUP: Honey is found in the forest and produced by honey bees that gather nectar from flowers. Honey is sold by itself and as an alternative to sugar in other products. Mushrooms are a fungi found in the forest. Mushrooms are used primarily as a food source, but are now being used in medical research as well. Nuts are a dry fruit with a kernel or seed that is enclosed in a shell. Nuts are used primarily as a source of food or flavor and can be found in candies, baked goods, and ice cream. It is a wonderful source of protein. The nut is also used in cleaning abrasives and added to chemical products found in glue and paint.



Thomas, Margaret G., Schumann, David R. Income Opportunities in Special Forest Products. Washington D.C.: USDA, 1993.

Planting and Caring for New and Existing Trees

Shade and Landscape Tree Selection:

Each year millions of trees are planted throughout Iowa. Many of these trees will be planted in urban communities. There are a few basic guidelines that should be considered to help insure a successful planting, including planning/site selection, species selection, and proper planting.

Planning/Species Selection:

- Consider where the above and below ground utilities are located (i.e. electric wires, phone and television cables, sewer and water pipes). Call Iowa One Call at 1-800-292-8989 at least two days before you start digging to find the exact location of underground utilities.
- Examine the soils in the selected site to make sure they match the tree species you will be considering. Does the soil stay wet or saturated for an extended period of time after rains? Or does the soil seem dry and somewhat sandy? Is this a high traffic area such as a playground that will have compacted, poorly drained soils?
- Pick a species that will fit in the site selected. The site should be a minimum of 40 feet away from electrical power lines and light poles, and 20 to 30 feet away from buildings for large shade trees.
- Consider low-growing trees for planting areas that are closer to power lines and light poles. Utility companies recommend keeping the vegetation at least 10 feet away from existing lines. Keep in mind that most power lines are 30 to 35 feet above the ground.
- Avoid planting low-growing trees near signs, street corners, and other areas where they could block people's view. Is the planting site in full sun, partial sun, or full shade?

Proper Planting:

- Dig the planting hole 2 to 3 times wider and no deeper than the root ball.
- Do not plant the tree too deep or too shallow, the root collar, (swelling where the trunk meets the roots), should be at or slightly above ground level.
- Lower the tree by the root ball, (not the trunk), carefully into the hole to avoid damaging the trunk or root system.
- Remove the twine and plastic labels from the branches and trunk, and at least the top one-third of the burlap and wire from the root ball. If the tree is container grown, remove it from the container.
- Fill the hole with the original soil, and do not use amendments such as moss or potting soil.
- Gently settle the soil in around the roots by hand when filling the hole, making sure that air pockets are not created.
- Slowly water the area to remove any air pockets that remain. Consider mulching around the tree with wood chips to keep the site moist.
- Add organic mulch around the tree being sure that the mulch is not piled up against the tree trunk. The mulch depth should be four to six inches deep and out as far as the branches spread.

"He who plants a tree, plants a hope."

-Lucy Larcom



"To be able to walk under the branches of a tree that you have planted is really to feel you have arrived with your garden."

-Mirabel Osler

What Tree Is Right for Your School?

Trees in the schoolyard provide beauty and shade, and can serve as visual screens. Unfortunately, it can be difficult to get a shade tree established in the tough growing conditions of schoolyards. The soils in the schoolyard are often poorly drained and compacted, making it difficult for a shade tree to survive and thrive.

Not all sites are appropriate for trees. Before planting, envision how the mature tree will fit into the site. **Will it interfere with buildings, utilities, sidewalks, playground equipment, or block the view of traffic near corners? Will the tree selected produce maintenance problems due to unwanted fruit or messy leaf litter?** Selecting a durable tree that best fits the planting site can reduce these problems.

During the planning, match the soil drainage on the property to the tree species, making sure that the tree will not outgrow the site. Diversify the species of trees you are planting to maximize the protection against diseases, insects, and environmental stresses. Proper planting and post planting care will help insure a healthy tree. Below is a list of trees and their growing requirements. Use this list to help determine what species is right for your school grounds.

Shade, Low-growing, and Landscape Trees:

Species	Life span	Growth rate	Shade tolerance	*Soil drainage	Height (ft)
Alder, Black	short	fast	intolerant	mp, mw, well	40-60
Ash, Black	short	fast	intolerant	poor, mp	40-50
Ash, Green	long	fast	intolerant	mp, mw, well	50-60
Ash, White	long	medium	intermediate	mp, mw, well	50-80
Aspen, Bigtooth	short	fast	very intolerant	mp, mw	20-40
Aspen, Quaking	short	fast	intolerant	mp, mw, well	40-50
Basswood, Amer.	long	medium	tolerant	mw, well	60-80
Boxelder	short	fast	very intolerant	poor-well	15-20
Cedar White	long	medium	tolerant	poor-well	40-60
Cherry, Black	long	medium	intermediate	mw, well	50-60
Cherry, Choke	long	medium	intermediate	poor-well	20-30
Coffeetree, Kent.	long	medium	intermediate	mp, mw	60-75
Cottonwood	short	fast	intermediate	poor-well	50-75
Hackberry	long	medium	intolerant	mp, mw, well	40-60
Hawthorn	short	slow	intolerant	mw, well	15-30
Hickory, Shagbark	long	slow	intermediate	mp, mw, well	60-80
Larch, European	long	medium	intermediate	mp, mw, well	40-80
Locust, Honey	short	fast	intolerant	mw, well	50-70
Maple, Amur	long	medium	intermediate	mw, well	15-20
Maple, Red	long	medium	intermediate	poor-well	40-60
Maple, Silver	short	fast	intermediate	poor-well	50-70
Maple, Sugar	long	slow	intolerant	mw, well	60-75
Mulberry, Red	short	fast	intolerant	poor, mp, mw	40-50
Oak, Bur	long	slow	intermediate	mp, mw, well	70-80
Oak, Pin	long	medium	intermediate	poor, mp, mw	60-70
Oak, Red & Black	long	medium	intermediate	mw, well	60-75
Oak, Shingle	long	slow	intolerant	mp, mw, well	50-60
Oak, Swamp White	long	fast	very intolerant	poor, mp, mw	50-60
Oak, White	long	slow	intermediate	mw, well	50-80
Pine, Jack	short	medium	very intolerant	poor, mp, mw	35-50
Pine, Red	long	medium	intermediate	mw, well	60-80
Pine, White	long	medium	intolerant	well	50-80
Poplar, White & Hybrid	short	fast	intolerant	mw, well	50-80
Red Cedar, Eastern	long	slow	very tolerant	mp, mw, well	40-50
Spruce, Blue	long	slow	intermediate	poor-well	30-60
Spruce, Norway	long	medium	tolerant	poor-well	40-60
Sumac, Smooth	short	fast	intolerant	poor-well	9-15
Spruce, White	long	slow	tolerant	mp, mw, well	40-60
Sycamore	long	fast	intermediate	poor-well	70-100
Walnut, Black	long	fast	intolerant	mw, well	50-75
Willow, Austree	short	fast	very intolerant	poor-well	30-50
Willow, Black	short	fast	very intolerant	poor, mp	30-50

*Poor, Moderately Poor, Moderately Well, and Well. Shade intolerant trees require full sunlight, intermediate trees can handle some shade, and shade tolerant trees can handle low, partial, or full sunlight. A short-lived tree has an average life span of less than 65 years of age. Trees with a long life span averages more than 70 years of age. As always, there are exceptions to these general rules.

Language of the Forest

Acre- An area of land that contains 43,560 square feet.

Annual Ring-The growth layer of 1 year, as viewed on the cross section of a stem, branch or root.

Benefit- A good and/or service produced as a result of having implemented an investment alternative. A benefit must have some human use or value to be included in financial analysis.

Bole- The main trunk of the tree.

Canopy- The layer of vegetation in a forest made up of tree crowns or tree tops.

Conservation- The protection, improvement, and wise use of natural resources to assure the attainment of their highest economic and/or social values.

Crown-The branches and foliage of a tree.

DBH- The diameter of a tree at breast height (4 ½ feet above the ground.)

Ecosystem-An interacting system of plants, animals, microorganisms, soil, and climate.

Endangered Species – Plant or animal whose existence is at risk through all or a significant part of its living range.

Forest- A plant community in which the dominant vegetation is trees and other woody plants.

Forester – A person college trained in the art and science of growing trees and forests.

Forestry- The science, art and practice of managing trees and forests and their associated resources for human benefit.

Habitat-The local environment in which a plant or animal lives.

Hardwood- A term used to describe broadleaf, usually deciduous, trees such as oak, maple, ash and elm. The term does not necessarily refer to the hardness of the wood.

Logger – A person whose profession is cutting trees for lumber and other wood products.

Photosynthesis- A chemical reaction that takes place in green plants in which carbon dioxide, water and sunlight combine to produce sugar and oxygen.

Renewable Resource – A naturally occurring resource, such as trees, that is continually replenished through biological growth and reproduction.

Root Collar- The place on a tree stem at or slightly below the ground line where roots first appear. The stem usually is slightly swollen.

Section – A parcel of land that contains 640 acres.

Seedling- A tree, usually defined as less than 1 inch in DBH, that has grown from a seed.

Softwood – A coniferous tree, cone-bearing, usually ever-green, having needles or scale-like leaves. Common softwoods include pine, firs, spruce and cedars.

Succession- The process by which one plant community is gradually replaced by another.

Thinning- Cutting trees in an immature forest stand to reduce the stocking and concentrate growth on fewer, higher quality trees.

Tree- A woody plant having a well-defined stem.

Tree Farm- A privately owned woodland dedicated to the production of timber crops. It may be formally recognized by the Tree Farm program of the American Forest Council.

Woodland- A wooded area in which the trees are often small, short bowled, and open grown. This includes farm woodlands, and wooded areas that are part of a farm.

Preventing Streambank Erosion



Degraded Streambank



Healthy Streambank



Most of us can agree that the term ‘erosion’ means something negative. But do any of us know what erosion really means? The definition of erosion is: The loss of soil from its original location.

So, why is losing soil in streambanks such a bad thing?

Streambank Erosion:

- Increases the sediment that a stream must carry.
- Results in the loss of fertile bottomland.
- Causes a decline in the quality of habitat on land and in the stream.

Erosion is a process that occurs naturally in streambanks, most often when the water level is high and the current is strong. These strong currents swing back and forth from bank to bank catching soil, sand and gravel, causing it to be deposited to other parts of the bank where the water is moving slower. Also, in times of flood, excess water causes the soil to become saturated and break off into the streams.

Although this is a natural process, altering the natural system of the stream can cause erosion rates that are hundreds of times higher than those of naturally stable streams. For example, a naturally stable stream in North Carolina was found to have erosion rates from fractions of an inch per year to 18 feet per year in unstable streams.

So, what causes this instability?

- When a stream is straightened or widened.
- Damaging or removing streamside vegetation.
- Land use changes such as clearing land for agriculture or development.



What can WE do to reduce or prevent Erosion?

- Don’t farm the land within 20 feet of a stream or river bank.
- Keep excessive weight away from a stream or river bank (including dead trees, debris and farm equipment).
- Don’t let livestock graze the stream or river banks.
- Remove any fallen trees or debris from the stream or river channel if they are causing stream or river bank erosion problems.
- Divert surface run-off or drainage away from areas where bank erosion is a problem.



What if Erosion is already a PROBLEM?

- Reshape the bank to a more gradual slope by cutting back the existing bank, (a minimum of one ft. tall for every 2 ft. in length.)
- Install soil bioengineering such as willow posts. This can also be accomplished by covering banks with brush, or trees such as willow cuttings.
- Fence out livestock.
- Plant grass, shrubs, rushes, sedges and trees that are native to the area and thrive in wet conditions.
- Use rocks and logs to help stabilize the stream.

The State Tree of Iowa



The state of Iowa is represented in the form of many different symbols. Iowa has its own bird, rock, flower and even its own flag. However, the state tree of Iowa stands out because it represents the state's strength and history. The oak became the state tree of Iowa in 1961. There are as many as 600 various species of the oak, but only twelve of these can be found in Iowa.



The oak is a canopy tree and usually grows to be about 80 feet tall. Oaks are beneficial to Iowa because of their strong, hard wood that is used in flooring, furniture, barrels, construction and even shipbuilding. The oaks are also beneficial to the wildlife of Iowa because of their acorn production known as 'mast', which is used as a food source by animals such as squirrels, pheasants, wild turkey and white-tailed deer.

Iowa's species of oak include: white, bur, pin, swamp white, northern pin, black, red, chinkapin, dwarf chinkapin, shingle, blackjack, and post. These various species of oak can be grouped into two broad categories, either red or white.

White oak trees can be distinguished by their leaves which are white-green on the underside and by the lobes or edges of the leaves which are rounded. The wood of the white oak is light beige and appears almost white when freshly cut. Iowa's white oaks include: bur, swamp white, chinkapin, post, dwarf chinkapin and white oak. Although these species are all in the white oak group, there are many differences between them. The bur oak is very slow growing, long-living and can adapt to a wide range of soils. On the other hand the swamp oak only tolerates the moist low-lying locations along streams. The chinkapin oak is known as an excellent shade tree and the white oak is known for its valuable lumber production. White oaks have very dense wood used for barrels.

The red oak can be distinguished by the reddish-orange color of its wood. Also, the lobes or edges of red oak leaves are pointed. There are also six species of oak that fall into the category of Iowa's red oaks including: pin, shingle, Northern pin, black, blackjack and red oak. These species also have many differences. The pin oak is a bottomland species that tolerates wet and poorly drained acidic soils. In contrast, the blackjack oak tolerates dry upland soils. The red oak is a very valuable wood used for furniture, flooring and paneling.

Can You Tell the Difference?

Match the name and description of the leaf on the left with its correct picture on the right.

A) The **Pin Oak** has leaves with three distinct, round bristle-tipped lobes. _____

B) The **Chinkapin Oak** has leaves that are not lobed. They have very coarse teeth without bristle tips. _____

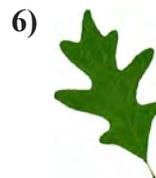
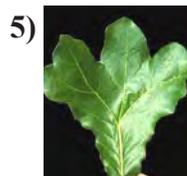
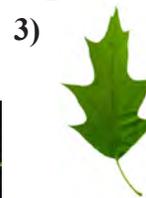
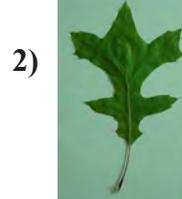
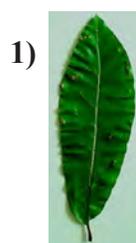
C) The **White Oak** has leaves with rounded lobes. _____

D) The **Post Oak** has rounded leaves with the largest lobes at the top and the two smaller lobes at the base of the leaf. _____

E) The **Red Oak** has leaves with pointed edges. _____

F) The **Shingle Oak** has leaves with NO lobes. _____

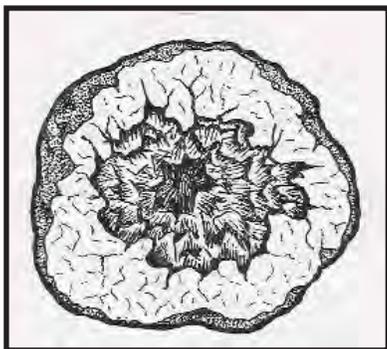
G) The **Blackjack Oak** has pointed leaves with the largest lobes at the top and the two smaller lobes at the base. _____



Iowa's State Symbols

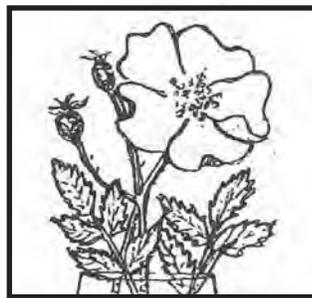
Did you know?.....

Iowa's State Rock is the
Geode



Most Iowa geodes contain large quartz crystals of various colors.

Iowa's State flower is the
**Wild Prairie
Rose**



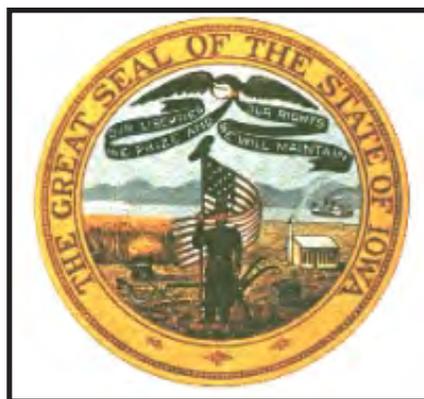
Wild Roses grow as a woody shrub in open woodlands, woodland edges, prairies and roadside ditches.

Iowa's State bird is the
**American
Goldfinch**



The goldfinch is a year-round resident of Iowa. It has distinct yellow and black feathers. It is a small bird with a wingspan of less than nine inches.

Iowa's State Seal looks like



The motto reads "Our liberties we prize and our rights we will maintain." The seal is represented on our state flag.



The Values of our Trees and Forests

Word Search



P L R N S C S E C U R I T Y O W D M
 R E A E H C F S I O A B L V H O R A
 O O E F E I H H N N I G Y N O I R U
 D X M I N C O M E H N R H F A E E S
 U Y P R N A E E M I E Y R N T F L U
 C G L E P E R A H T A E A S E B A S
 T E O W I R L T A D B E P H N E X T
 S N Y O T A O W E M L V N A O A A A
 C R M O O L N P U C N R S D I U T I
 F E E D C A H L E E A H C E E T I N
 T C N H E A T O P R I V A C Y Y O A
 O R T L N T B R M D T E N N M W N B
 D E C P A P E R D C I Y R E N A L L
 M A S O F T D R I N K S V N S R T E
 U T A I D E O T S N S U O A C T C A
 L I F M A E C I E R D S A O L O S O
 C O O E S T A W I L D L I F E U R I
 H N D A T O U R I S M I Y E A M E K

Word Box

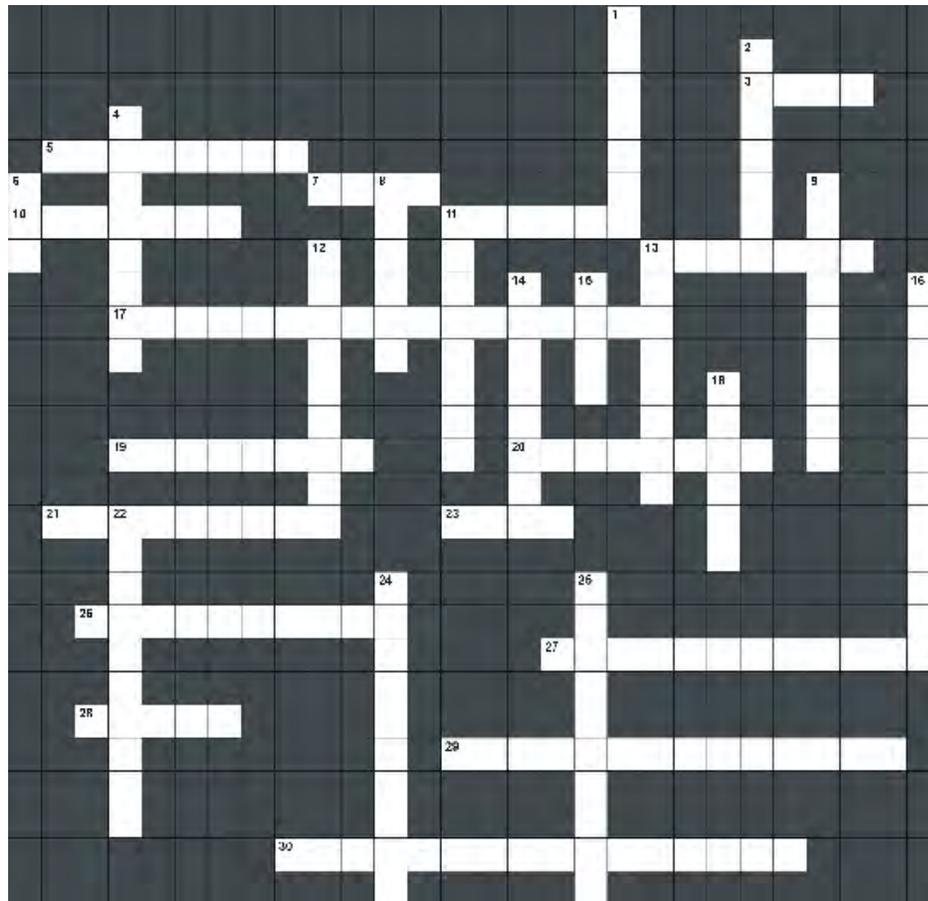
Beauty
Clean Air
Clean Water
Clothing
Cork
Employment
Firewood
Food
Income

Lumber
Mulch
Nests
Oxygen
Paper
Privacy
Products
Property Value

Recreation
Relaxation
Security
Shade
Soft Drinks
Sustainable
Tourism
Wildlife

The Values of Trees and Forests

Crossword



ACROSS

3. An area of land that contains 43,560 square feet.
5. A term used to describe a broadleaf, deciduous tree (such as oak, maple, ash or elm).
7. The main stem of a tree.
10. A good and/or service that promotes well being.
11. A plant community in which the dominant vegetation is trees and other woody plants.
13. A parcel of land that contains 640 acres.
17. A naturally occurring resource, such as trees, that is continually replenished through biological growth and reproduction.
19. A general term used to describe a coniferous, cone-bearing, usually evergreen tree (such as pine, fir, spruce or cedar).
20. Cutting trees in a young forest to allow space for the

remaining trees to have more space to grow.

21. A volume measure of lumber - equal to 1 foot wide by 1 foot long by 1 inch thick.
23. A cubic volume measure of firewood or pulpwood.
26. The process by which one plant community is gradually replaced by another.
27. The protection, improvement and wise use of natural resources.
28. The branches and foliage of a tree.
29. A chemical reaction in green plants that combines carbon dioxide and water to produce sugar.
30. The process of caring for a forest so that it remains healthy and vigorous and provides the products and opportunities that the landowner desires.

DOWN

1. The cutting and removal of final crop trees from the place that they were growing.
2. The local environment in which a plant or animal lives.
4. A privately owned woodland dedicated to the production of timber crops.
6. An acronym for the diameter of a tree at breast height (4 1/2 feet above the ground).
8. A person whose profession is cutting trees for lumber and other wood products.
9. An interacting system of plants, animals, micro-organisms, soil and climate.
11. The science, art and practice of managing trees and forests and their associated resources.
12. A volume measurement equivalent to a cube measuring 1 foot on each side or 1728 cubic inches.
13. A term for a young plant, recently sprouted from the seed.
14. A person who is college trained in the art and science of growing and caring for trees and forests.
15. A large woody plant having a well-defined stem, typically growing in excess of 10 feet in height.
16. The process by which the forest is replaced or renewed by natural or artificial means.
18. The layer of vegetation in the forest made up of tree crowns.
22. The growth layer of 1 year, as viewed on the cross section of a stem, branch or root.
24. A classification for a plant or animal whose existence is at risk through all or most of its natural living range.
25. The place on a tree stem at or slightly below the ground line where roots first appear; the stem is usually slightly swollen at this location.



“Hanging with Ashley” On The Web

The importance of trees and forests in a community

Background

The internet or World Wide Web has become a tremendous source of information on many different topics related to the environment. This activity will give students an opportunity to read an on-line book called the “Forest Where Ashley Lives”. Ashley is 7 years old and her dad is a “town forester”. Ashley will take the students through her community and teach them about a variety of tree topics, and help them understand that if they live in a town or city they may also live in a forest.

Procedure

Have the students work in groups to answer the questions below by logging into the homepage that has the book “The Forest Where Ashley Lives” on it. Some of the answers will not jump right out at the students, which will encourage them to read and research for their needed information. Have a group discussion on the answers and general topics once the students have completed the sheet.

Section I. The Forest Where Ashley Lives

Address: <http://www.extension.iastate.edu/Publications/PM1812.pdf>

- 1) A forest is a place with _____ and other plants, _____, and non-living things.
- 2) **True or False.** All of the trees found in a city or a town create a special kind of forest called a “city or town forest”.
- 3) Along with space, the gases oxygen and carbon dioxide, what are four other things that trees need to help them grow? _____, _____, _____, _____
- 4) What are the three main parts of a tree? _____, _____, _____
- 5) What tree part is the food-making factory? _____ .
- 6) Tree roots _____ the tree in the ground, help _____ the soil, and absorb _____ and _____.
- 7) The trunk is the passageway where _____, _____, and nutrients move between the _____ and the _____.
- 8) A forest is a kind of ecosystem. Along with wetlands, swamps, deserts, and tundra’s name three other examples of ecosystems? _____, _____, _____
- 9) Trees that drop their leaves in the fall are known as _____ trees.

10) Name three different types of deciduous trees that begin with an S?

Name four different types of oaks:

11) Trees can be identified by things like leaf shape, _____, _____, tree shape, _____, _____, and seeds.

12) Conifer trees have thin _____ leaves with names like pine, _____, and _____. Most conifers stay green all year long, even in the winter. These trees are called “_____”.

13) Along with Tamarack and white pine what are two other types of conifers?
_____ and _____.

14) Forests can provide homes for animals such as squirrels, _____, _____, owls, raccoons, _____, and beetles. Trees can also provide _____ for some animals.

15) Plantings of grasses, shrubs, and trees along streams and rivers are called “_____”. These “_____” can improve the _____ quality and provide homes for _____.

16) In a forest, tree and other _____ roots _____ out some of the unwanted materials in the water as it moves through the _____. This helps clean the water we drink at home and school.

17) Trees from forest provide wood to make things like _____, _____, toilet paper, _____, baseball bats, _____, _____, paper bags, and many other things we use every day.

18) **True or False.** During a process called photosynthesis, trees produce the invisible gas called oxygen which is needed by all living things to survive.

19) **True or False.** Shade trees planted on the east and west side of a house can save energy by cooling the house in the summer.

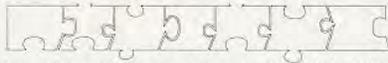
20) During the process of _____ tree leaves produce _____ sugars for tree _____ plus _____ for us. Energy from the _____ is what gets photosynthesis in the leaves started.

21) **True or False.** You can tell the age of a tree by counting its growth rings.

22) Arbor Day is a National tree planting day. The first Arbor Day was in _____, in the state of _____ where over _____ million trees were planted throughout the state.



ACTIVITY PAGE



Word Puzzle

Use the pieces above to fill in the spaces of the hidden message. We have done one piece for you!

ROM	NE,	Y	VA	CHA	PRO	MS	S	ERR
BLE	ESTS	,MED	EY,	M	MS,	N	HON	,WI
LUA	ROO	ND	B	VIDE	UIT	A	UCH	UTS

F O R				M A N		
	I T E			A S A		
	A T I C S		R C O A L		I C I	
		U S H				
L D F R			I E S.			

MATH DECODER

Try to fill in the missing numbers in the left box and decode the message below using the letters in the matching box on the right. Use the numbers 1 through 9 to complete the equations. Each number is used

<input type="text"/>	-	<input type="text"/>	x	<input type="text"/>	=	2
6	x	<input type="text"/>	-	<input type="text"/>	=	19
9	+	<input type="text"/>	+	<input type="text"/>	=	13
18		27		-1		

T	-	R	x	E	=	2
I	x	A	-	Y	=	19
!	+	S	+	F	=	13
18		27		-1		

only once. Each row is a math equation. Solve the rows from left to right. Each column is a math equation. Solve the columns from top to bottom. The numbers in the boxes on the left are equal to the letters on the right. We have started, to give you a hint.

<input type="text"/>	I	<input type="text"/>	<input type="text"/>	!	Letter of box in right table							
1	4	3	2	8	5	3	6	7	1	8	9	Value of box in left table

Soils and Impacts on Tree Growth

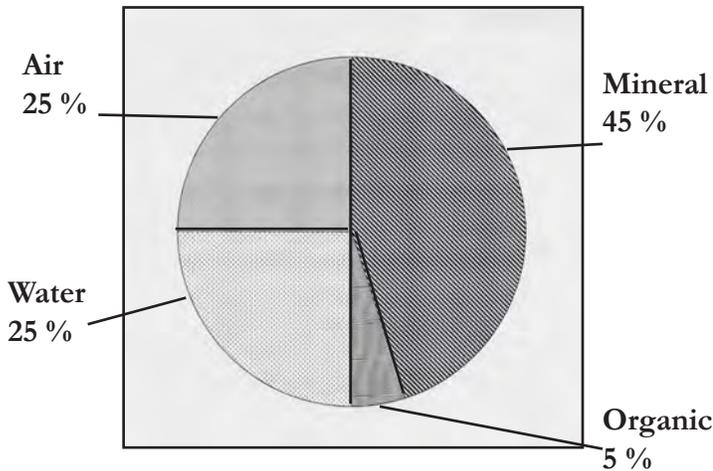
Interpreting Charts and Graphs

Human life is dependent on soils and to a certain extent, good soils are dependent upon human use and protection of the land. Great civilizations from Egyptians to Romans have almost invariably had good soil as one of their critical natural resources to grow food and fiber. Soil destruction associated with the cutting of timber in watersheds encourages erosion, topsoil loss and pollution of rivers and lakes.

Soil can be defined as a mixture of rocks, minerals and decayed organic matter. There are four main components of soil: minerals, organic materials, water and air. From Figure A, the optimum soil for tree growth contains 45% minerals, 5% organic, 25% air and 25% water. (Mineral and organic content stay constant unless erosion occurs.)

Optimum Soil Makeup

Figure A



See answer page for answers

Soils are composed of particles that vary greatly in shape and size. There are three broad soil texture groups that foresters used to describe soils. They include: sand, loam and clay. Sandy soils are large in size and have a large amount of air space which allows rainfall to drain quickly. Clay soil particles are small in size and very close together making drainage slow. An ideal loam soil may be defined as a mixture of sand, silt and clay particles.

The common field method of determining the class of soil is by feel. By rubbing a wet or dry soil sample between your fingers, you can determine your soil class according to the chart below.

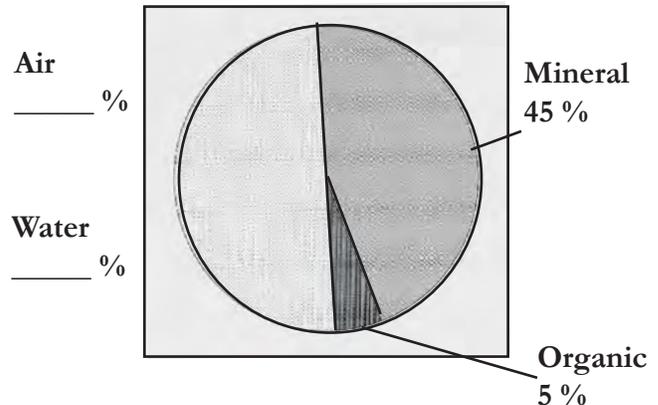
Soil Class	Soil Squeezed Dry	Soil Squeezed Wet	Trees that you can plant
Sand	Falls apart when squeezed	Forms a cast but crumbles	Pines, Spruce
Loam	Forms a worm-like cast that easily breaks	Forms a cast that can be handled	Walnut, Oak
Clay	Breaks into hard lumps	Will form a long, flexible playdough ribbon	Silver Maple, Swamp White Oak, Wycamore

Which soils allow the best tree growth?

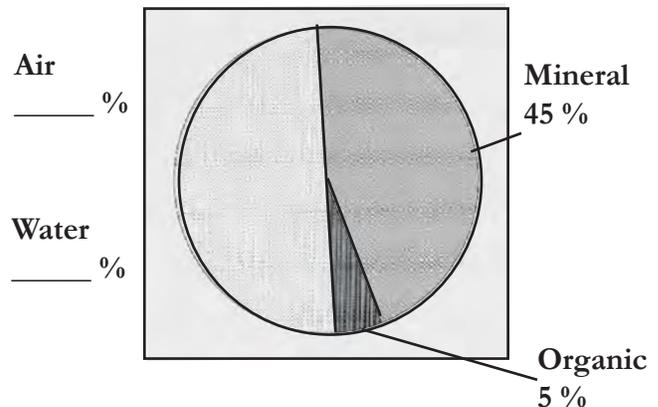
Which soils are present around the school building?

Which soils are found along flood plain forests?

Using your pencil, indicate below the effects flooding has on the percent of water and air in the soil. (i.e. does the amount of water increase or decrease during a flood?)



Using your pencil, indicate below the effects drought/no rain has on the percent of water and air in the soil. (i.e. does the amount of air increase or decrease in a drought?)





Make Your Landscape EDIBLE!



Many if not all of us get the food that we eat from a grocery store, farmer's market, or a similar consumer outlet. Living in an agricultural state like Iowa, we are exposed to different parts of the food system and generally have some knowledge about where food comes from before it reaches our table. However, what we eat and where it comes from has changed a lot since the European settlement.

When European settlers came to Iowa, they planted apple trees to provide fresh fruit and to supplement their food supply. A large number of farmsteads contained apple and other fruit-producing trees and shrubs for feeding the family. From 1799, when the first recorded apple tree planting took place, until the late 1800's, Iowa increased its apple production, both for consumption by residents and for exportation out of the state. However, apple production dropped in the 1900's and did so dramatically in 1941 following a damaging freeze during the previous fall. Since this freeze, the state has focused on corn and soybeans. Even though apple trees are not as common as they once were here in Iowa, they can still provide many benefits.

In addition to apples, there are many trees and shrubs that produce fruit or nuts that can be a great source of fresh, healthy food. Food from your own backyard gives you right off of the tree freshness. It gives you the reassurance of knowing what, if any, chemicals have used on the fruit. There are a number of other benefits that can come from growing these plants, including: gaining a source of enjoyment from growing something (similar to gardening), an opportunity for learning, and a fun family activity. Community gardens provide these benefits in addition to an affordable source of healthy food for people with low or moderate-income, as well as a forum for interacting and developing a sense of community.

What is an edible landscape?

- A part of the overall landscape that produces healthy, nutrient-rich, and good-tasting foods.
- Typically composed or partly composed of perennial plants (persistent from year to year) such as fruit trees, berry bushes, strawberries, asparagus, grapes, rhubarb, etc. Trees (including fruit trees) are an important part of the overall landscape.

How can I make my landscape edible?

- Plant fruit and nut-bearing trees at your home, school, community garden, or other community-based location.
- Like other trees, the success of fruit trees is dependent upon matching the tree's needs to the characteristics of the site, such as soil type, precipitation level, exposure to sunlight, etc. It is best to plant trees that are compatible with the site characteristics - "right tree for the right site".
- Provide ongoing care for the trees, such as mulching, watering during the first year, avoiding damage from lawn mowers and weed trimmers, pruning, etc.

Enjoy the fruits of your labor!



In addition to my residence, where would an edible landscape be appropriate in my community?

- Near community shelters for people who need assistance.
- Schools and libraries are also possible places.

What types of plants would be well-suited for Iowa's climate (cold hardiness to survive the winter), soil conditions, amount of precipitation, etc.?

Some of these plants may only be appropriate in certain parts of the state according to climate or in certain types of soils, so further information will be necessary to determine if you should plant them at your site (Iowa State University Extension publications PM 1788 and PM 453 contain more specific information).

Small Fruits:

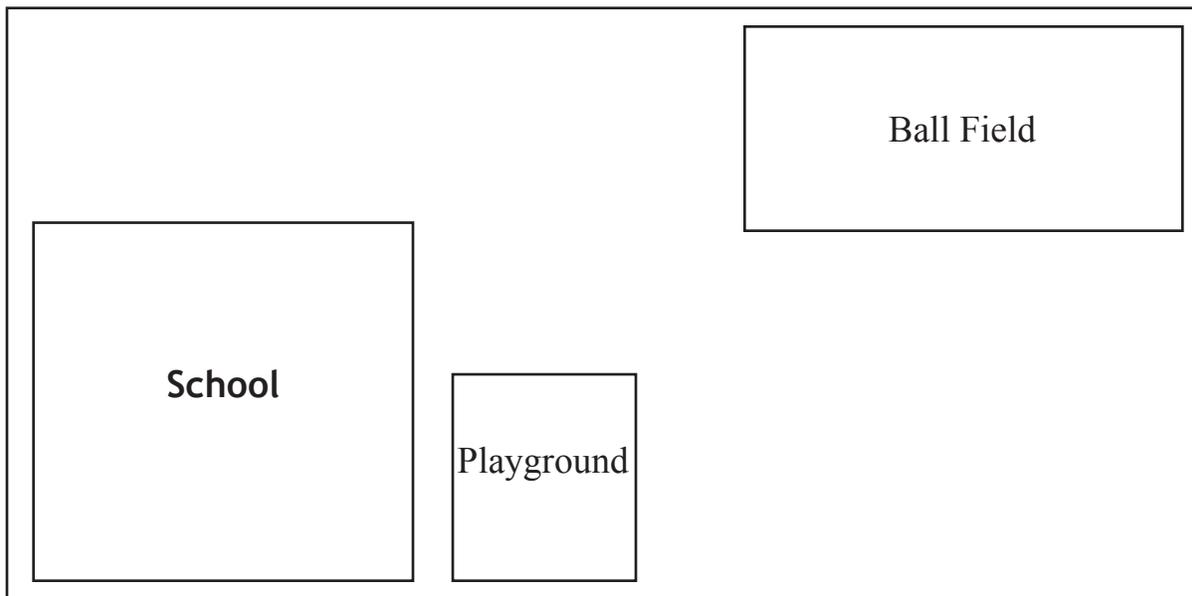
Strawberries, raspberries, blackberries, grapes, blueberries, gooseberries, currants, and jostaberries.

Fruit & Nut Trees:

Apples, pears, sour cherries, bush cherries (sand, nanking, cherry plum), plums, apricots, black cherries, hazelnuts, and hickories.

Activity - Creating an Edible Landscape at School

Imagine that the diagram is a drawing of your school. Your Principal has asked you to develop a plan to add fruit trees to the schoolyard so that you and the other students can enjoy a healthy snack of fruits after recess. Draw and label trees and other fruit-bearing plants that you would like to install and eventually eat. Remember, even small fruit trees can take up a large amount of space when they mature, so think about what the best site might be for each type of plant.



DID YOU EVER **EAT** A TREE?



BRAINSTORMING FOOD SOURCES



ACTIVITY:

BRAINSTORM A LIST OF FOODS THAT COME FROM TREES:

WHAT MEDICINES COME FROM TREES?

WHAT DRINKS COME FROM TREES?

WHAT **PARTS** OF TREES PROVIDE US FOOD, DRINKS, AND MEDICINE?

NAME SOME TREES FROM **IOWA** THAT PROVIDE US FOOD:

NAME SOME TROPICAL TREES THAT PROVIDE US FOOD, DRINKS, AND MEDICINE:

NOW, LOOK AT YOUR SHEET. HOW MANY DIFFERENT PRODUCTS DID YOU THINK OF? TREES FROM THE FORESTS PROVIDE US WITH **HUNDREDS** OF PRODUCTS, SO MANY IN FACT, THAT IT WOULD BE VERY HARD TO NAME THEM ALL WITHOUT THE HELP OF BOOKS AND OTHER INFORMATIONAL RESOURCES. TO FIND MORE PRODUCTS OF TREES AND FORESTS GO TO:

<http://www.fpl.fs.fed.us/documnts/usda/agib666/agib666.htm>



Reading Rangers.....

Read a book and plant a tree with the Iowa Department of Natural Resources for Earth Week 35 & Arbor Day 2005!



We know that planting trees is a lot of fun for kids and teachers alike, yet it may not be possible for your class to plant a tree this Earth/Arbor Day due to space limitations on school grounds, or time constraints for classroom activities. In response to the need for new trees, and the knowledge that classes may not have enough time to plant their own trees personally, the Forestry Bureau of the Iowa Department of Natural Resources (DNR) has developed a program called Reading Rangers.

The Reading Rangers program offers trees to be planted by DNR foresters in state forest and wildlife areas in exchange for students reading nature related resource publications. These nature publications may be either books or magazines, as long as their subject matter relates to our natural environment. The DNR will plant a tree for each student who reads a minimum of 20 pages of a nature-related resource publication during Earth Week (April 23-30, 2005). That's right! If someone reads 200 pages, we'll plant ten trees in return! You may read one 200-page book or ten 20-page books, but as long as you meet that challenge, the DNR will meet your pages with a freshly planted tree!

Send us the names of your students (see form opposite) who read nature related publications during Earth Week and the number of pages they each read, and we'll plant the trees and send the class a Reading Rangers certificate of appreciation. Check out a listing of books and other resources on the inside cover of this booklet.

Thank you for your support of the Trees for Kids and Reading Rangers programs! We hope you and your students enjoy learning the value of trees in our environment!

Please mail your record sheets to:

**Trees For Kids - Reading Rangers
IDNR - Forestry Bureau
Wallace State Office Building
Des Moines, IA 50319-0034**



How To: Help an injured bird or wild animal



Baby birds are very vulnerable to predators because many of them cannot fly yet. If you find a baby bird by them self, you should return them to their nest. If you cannot find their nest, place the baby in a tree or an elevated place.

Don't worry, it is a misconception that parents won't accept their baby after a human touches it. Actually, birds do not have a very

developed sense of smell, and they will accept their baby back without noticing the human scent.

Many birds are injured or killed by flying into windows. You can prevent this by closing the curtains to decrease the reflectance of the glass.

If you do find a bird that has been stunned by flying into a window, put the bird in a paper sack, close it loosely with a clothespin and place the sack in a quiet and warm area. This will allow the bird to recover in a stress-free environment. When the bird appears to be standing or moving you may release it.

Injured animals, especially babies, often need assistance being nursed back to health. Many times, it is best to let professionals provide the assistance. You should concentrate on keeping them safe until they can receive help.

First of all, if you find an injured reptile such as a snake, you should place them in a warm and secure place. A pillow case tied shut is good, because they can't easily escape. They generally need to be kept between 60-70 degrees Fahrenheit while waiting for treatment.



Finding an injured animal is not uncommon, but finding an injured *mammal* is. Most injured mammals hide. If a wild mammal is close to a human it is usually severely injured or diseased. If you come across a raccoon, fox, opossum, coyote or muskrat, do not handle them. They may bite if frightened or threatened. Call a professional in this situation.

Remember, most injuries need professional medical attention. If you feel the injury is severe, call your local conservation officer. Visit www.iowadnr.com for a listing. Also, even though the animal is injured, it may still be dangerous.



Quiz



1) What do you do if you find a baby bird away from the nest?

- a. leave it be.
- b. put it in a box with holes.
- c. return it to the nest.

2) Who is the best person to call when you want advice about an injured wild animal?

3) What temperature should you keep an injured reptile at? _____

4) Most injuries do not need professional attention. T/F

5) Why do you put a stunned bird in a paper sack in a quiet and warm area? _____

6) What do you do when you find an injured *mammal* such as a raccoon?

- a. put it in a box.
- b. call a professional.
- c. carefully pick it up and place it in warm area.

8) A mother bird will not accept their baby after a human touches it. T/F

9) It is extremely common to find an injured mammal. T/F

"Finding an injured wild animal." Keeping Iowa Wildlife Wild. Iowa: Iowa Association of Naturalists, 1995.





Why Wooden Pencils?



 Many things that we use in our daily lives come from trees. The tissue you use to wipe your nose, the paper you use to take tests on, even the pencil that you use to write with. Did you ever stop to wonder why some of these things are made from the wood of trees? Why wouldn't they just use steel or plastic to make pencils?

Activity:

 Distribute papers with the headings: Wood, plastic, steel, aluminum copper, iron.

 Divide into six groups. Each group should compile a list of products used in the school that are made from one of the six materials listed above. After the individual groups have discussed which products are made of which material, make a master list with the products listed under the material they are made from.

 Now, each student should pick any three products that are made from a different material, for example, a wooden pencil, a metal pen and a plastic chair. Write an explanation for why each product was made by the material.

- ♦ What things make the materials better suited to some products rather than others?
- ♦ Which materials are made of renewable resources? (Renewable resources are things that can be naturally replaced.)
- ♦ Which are non-renewable resources? (Some materials may be produced from both.)
- ♦ Which products are reusable?
- ♦ Which ones are recyclable?

Iowa's Trees and Forests Resources

WEBSITES

Project Learning Tree

Includes sample lessons and describes this interdisciplinary environmental education program.

<http://www.plt.org/>

Iowa Department of Natural Resources' Kids Pages

Includes puzzles and other fun environmental activities

<http://www.iowadnr.com>

Earth Day at Kids Domain

Includes Earth Day history and activities

<http://www.kidsdomain.com/holiday/earthday/index.html>

Carly's Kids Corner National Arbor Day Foundation

Includes fun tree-related activities for kids

<http://www.arborday.org/carly/carlyskidscorner.html>

Science for Kids U.S. Department of Agriculture

Shows how science applies to daily life and encourages learning about science and science careers. Includes teacher's resources.

<http://www.usda.gov/news/usdakids/>

Iowa State University Forestry Extension

Identification of common trees of Iowa with an interactive key.

<http://www.extension.iastate.edu/pages/tree/>

U.S. Environmental Protection Agency

Includes information on landscaping with natives the benefits of natives and a native plant fact sheet

<http://www.epa.gov/greenacres/>

BOOKS

Shearer, Barbara S., Shearer, Benjamin F. State Names, Seals, Flags and Symbols.

An Iowa Supplement to Project Learning Tree, K-8. Linette Riley and Kay Neumann. Iowa Department of Natural Resources - Forestry Division, 1993.

The Changing Forest: Forest Ecology. American Forest Foundation: Washington, DC, 1996.

Ranger Rick's NatureScope, National Wildlife Federation. "Endangered Species: Wild and Rare". McGraw-Hill, 1997.

Forests. Peterson Field Guide Coloring Books. John Kricher and Roger Peterson. Houghton Mifflin, 1983.

Overbeck, Elizabeth. How Seeds Travel. Lerner Publications, 1982.

Parker, Steve. Insects. DK Publishing, 1997.

Van Allsburg, Chris. Just A Dream. Houghton Mifflin, 1990.

Carson, Rachel. Silent Spring. Houghton Mifflin, 1962.

Gamlin, Linda. Trees. DK Publishing, 1997.

The ANSWER Page



Crossword (page 17)



Word Search (page 16)



The Life Cycle of Trees: (page 4) (answers from tip of arrow going clockwise)
seed, sprout, sapling, mature tree, dead tree, rotting log.

How to Help an injured bird or wild animal: (page 28)

- 1.) c
- 2.) local conservation officer
- 3.) 60-70 degrees Farenheit
- 4.) False
- 5.) So they can recover in a stress free environment
- 6.) b
- 7.) False
- 8.) False

"Hanging with Ashley" on the Web (page 18)

Section I: 1) trees, animals 2) True 3) soil, sunlight, water, nutrients 4) roots, trunk, crown 5) crown 6) anchor, hold, water, nutrients 7) food, water, roots, crown 8) rivers, prairies, oceans 9) deciduous 10) silver maple, sycamore, sugar maple, pin, bur, white, and red 11) leaf edges, fall color, bark, fruit 12) needle-like, spruce, fir, evergreen 13) spruce, fir 14) birds, rabbits, butterflies, food 15) buffers, buffers, water, animals 16) plant, filter, ground 17) paper, books, houses, pencils, chairs 18) True 19) True 20) photosynthesis, simple, food, oxygen, sun 21) True 22) 1872, Nebraska, one

The State Tree of Iowa (page 14)

- A) 5 B) 7 C) 6 D) 4
E) 3 F) 1 G) 2

Activity Page (page 20)

Word Puzzle: Forests provide many valuable products such as aromatics, charcoal, medicine, honey, mushrooms, nuts, wild fruit and berries.

Math Decoder:

SAFETY FIRST!
14 32 85 367 189

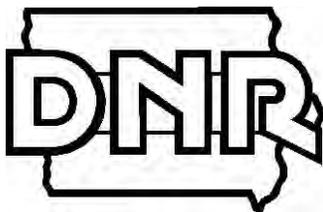
Interpreting Charts and Graphs (page 21)

In the case of a flood the percent of water would be 50% and air would be 0%, values will vary depending on severity of flood. In the case of a drought, the air would be 50% and the water would be 0%, values will vary depending on severity of drought.

Thanks for caring about Iowa's Natural Resources!



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