BASIC ACTIVITY

Design a healthy, diverse community forest

Classroom Activity:

- **Students will design a diverse community forest landscape plan**

Objectives:

- **Students will demonstrate knowledge of specific trees' growth characteristics, landscape functions and planting site requirements by designing a diverse community forest landscape plan**

Time Recommended:

- **60-90 minutes**

Materials Needed:

- **Photocopied worksheets on pages 12-17**
- **Scissors**
- **Glue or glue sticks**
- **Ruler**
- **Pencils and paper**

National Education Standards Correlation:

National Science Education Standards Correlation:

- **Design a solution or product in light of the information at hand**
- **Understand diversity and adaptation of organisms**

National Geography Education Standards Correlation:

- **Understand characteristics and spatial distribution of ecosystems on Earth's surface**

National Social Studies Education Standards Correlation with People, Places, and Environments:

- **Estimate distance, calculate scale, and distinguish other geographic relationships such as population density and spatial distribution patterns**
- **Examine, interpret, and analyze physical and cultural patterns and their interactions, such as land use, settlement patterns, cultural transmission of customs and ideas, and ecosystem changes**
- **Propose, compare, and evaluate alternative uses of land and resources in communities and regions**

Instructional Sequence:

Assess your students' prior knowledge and awareness of trees by asking how many different kinds of trees each student sees on their way to school. Record the responses, without comment, on the board. Ask students how they can tell different trees apart. Responses will vary. Some leading questions to ask could include:

Does the tree have special fruits or seeds?

Does the tree have a unique shape?

Are the leaves broad and flat or are they needle-like?

Does the tree stay green all year round or does it lose its leaves?

What does the bark look like? (color, texture, thickness)

If students are unfamiliar with trees, or if time allows, go outside to observe trees together as a class. Take the Tree Clue Sheet (page 12) to use as a guide. Look for leaves and seeds, both on the trees and on the ground. Ask students to point out leaf patterns and shapes. Have students feel the bark on several different trees and then describe the texture and the color. Encourage students to mimic the shape of the tree with their bodies. Return to the classroom.
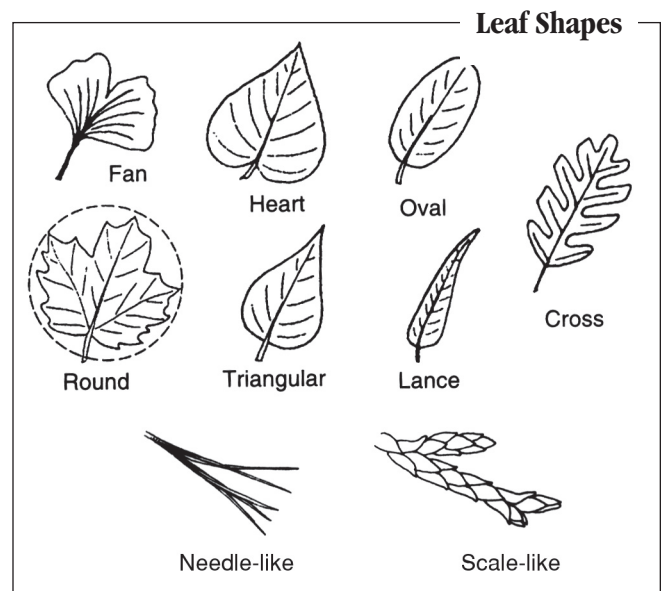
Leaf Shapes: Fan, Heart, Oval, Cross, Round, Triangular, Lance, Needle-like, Scale-like

Concept #1: Without a diversity (variety) of trees, one disease or insect could destroy all the trees in an area.

Concept #2: Trees come in different shapes and sizes.

Concept #3: Some trees need certain locations, temperatures and soils to survive.

Concept #4: A greater diversity of trees means a greater diversity of wildlife.

Concept #5: Tree diversity provides beauty and interesting variety.

Hand out copies of the Vocabulary Sheet/Rubric and the Tree Information Sheets (pages 13-15) to each student.

Tell students that they are going to create a community forest landscape plan by selecting appropriate trees to "plant" in designated locations. Explain that knowing how to properly plant a tree is important, but planting the right tree in the right place is essential if you wish to enjoy that tree for years to come. In selecting a tree for a specific location there are several important things to consider.

Write the following five concepts on the board as you discuss them (see above). Include some of the background information in the discussion. Bolded words are defined on the Vocabulary Sheet, but if students are unfamilar with any of the terms, define them as you progress though the concepts.
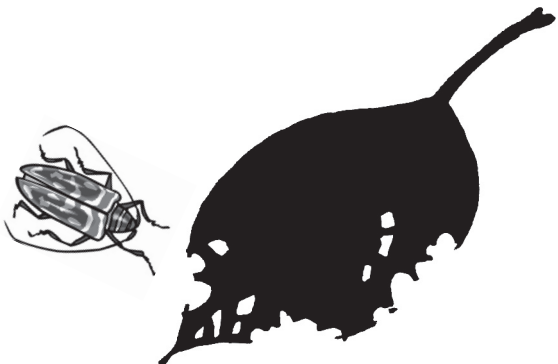
Concept 1: Without a diversity (variety) of trees, one disease or insect could destroy all the trees in an area.

Background: Explain that insect pests and diseases can affect almost any tree but usually these are not life-threatening to the tree. For example, tiny insects cause bumpy, wart-like **galls** to develop on hackberry leaves. While these galls do not kill the tree, some people think the galls make the tree less attractive. But occasionally a disease or pest will appear and almost completely destroy a particular tree **species**.

For instance, the American elm was once the most commonly planted **street tree** in North America. A fungus called Dutch Elm Disease found its way to the United States and spread across the nation killing millions of elm trees and leaving many cities almost treeless. Planting a **diversity** of trees prevents one disease from destroying all the trees in a community.
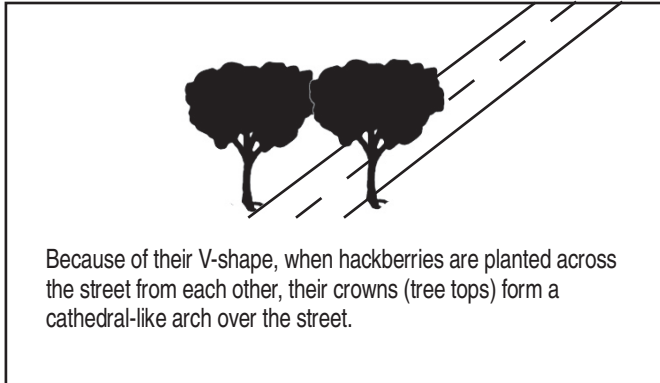
Ask students to look at the "Comments" section for each tree on their Tree Information Sheet and identify a tree species that has problems with pests or disease. (Answer - Lombardy poplar.)

Lombardy poplars were once commonly planted because of their unique columnar (tall, thin) shape and rapid growth rate. Today, Lombardy poplars are affected by a disease that causes the trees to die after about ten years. Because of their disease problems, Lombardy poplars are not recommended for planting today.

Concept #2: Trees come in different shapes and sizes.

Background: If given enough space to grow, trees have characteristic **shapes**. Some shapes fit better in a space and serve different functions than others. For example, a tree with a rounded **crown** (tree's leafy top) will shade your backyard.

Because of their V-shape, when hackberries are planted across the street from each other, their crowns (tree tops) form a cathedral-like arch over the street.
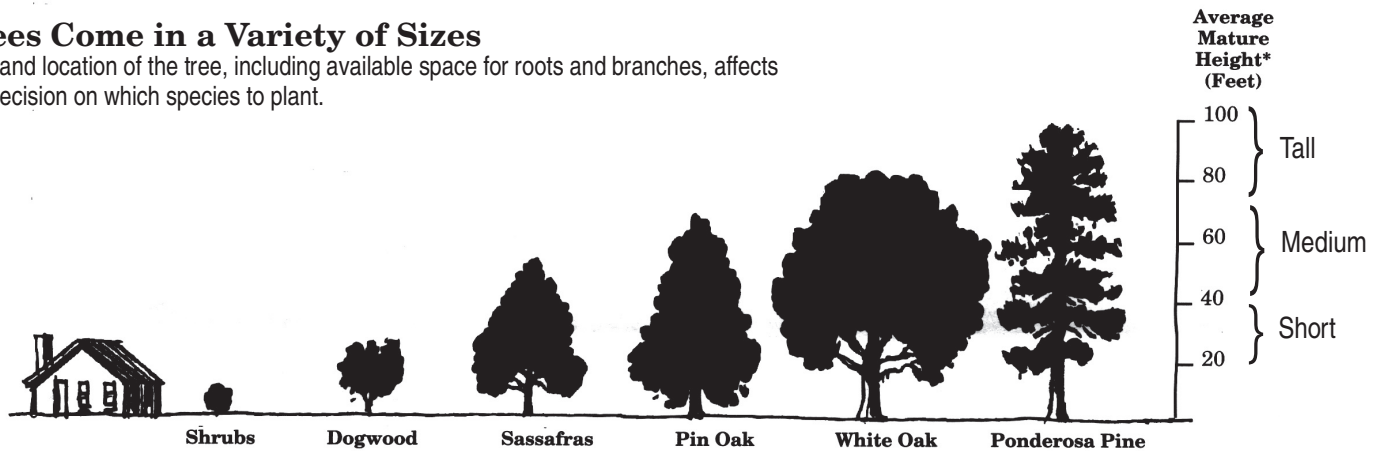
Pyramidal-shaped trees, especially **evergreens** that are wider at the bottom than at the top, provide less shade but are better at breaking the wind nearer the ground. The pyramidal-shaped tree that takes up more space near the ground means less lawn to mow, but also less space to play.

Ask students to look at the "Key to Tree Shapes" on the bottom of their Tree Information Sheet. Have them identify the shapes of the trees listed.

Size is also important in tree selection. Knowledge of whether a two-foot seedling will grow into a 30' high tree with a 20' **spread** (width) or a 100' tree with a 70' spread is critical in deciding where to plant a particular tree. Trees too large for a particular site can quickly crowd a house, block a view, or get tangled in power lines. (See page 9.)

Trees Come in a Variety of Shapes

Crown Form or Shape varies among species, including round, oval, columnar, V-shaped or pyramidal shapes. Consider how the shape of the tree works in the space available.

Round	Vertical Oval	Horizontal Oval	V-Shape	Pyramidal (triangular)	Columnar (tall and thin)
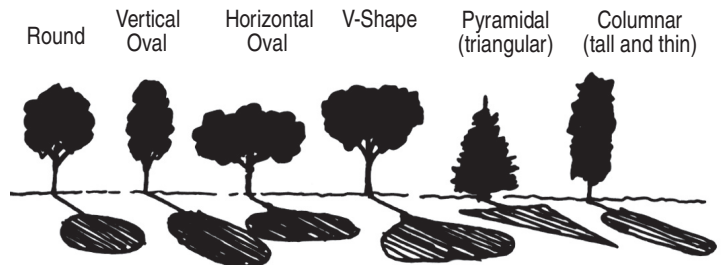
Ask students to identify which trees on the Tree Information Sheet will grow to be the largest ...the smallest?

The tree's purpose will impact the suitability of different tree species, whether used for shade, aesthetic beauty, wind protection, screening, or other purposes.

Teacher's Tip!

If time permits, have your students draw and cut out the different tree shapes. Go outside. Have students hold the different shapes in front of the sun and look at the different shadows they cast. Have students make the tree shapes with their bodies. Sketch each tree shape and its shadow!

Trees Come in a Variety of Sizes

Size and location of the tree, including available space for roots and branches, affects the decision on which species to plant.

Average Mature Height* (Feet)

- 100
- 80   } Tall
- 60   } Medium
- 40
- 20   } Short

Shrubs   Dogwood   Sassafras   Pin Oak   White Oak   Ponderosa Pine

Concept #3: Some trees need certain locations, temperatures and soils to survive.

Background: Discuss with students that it is important not only to determine if the tree fits the location, but if the location provides what the tree needs to survive. Do the environmental factors of the location provide conditions that the tree needs to grow?

Ask students to think what some of these environmental conditions could be.

Environmental factors include:

• **Temperature:** The average lowest temperature of the year limits the growing range of many trees. Some trees grow best in cool climates; some do best in warm climates; while some trees can tolerate a wide range of temperatures.

> Want to learn more? At www.arborday.org/zones the National Arbor Day Foundation has a hardiness zone map with the country divided into regions based on temperature. Using this map, you can determine if a particular tree will survive the climate where you live.

• **Soil and Moisture:** Each tree species can tolerate wet or dry growing conditions to a different degree. Some species do better in sandy soils, some grow better in rocky or clay-like soils. The soil in parking lots often contains a great deal of salt from winter de-icing. The salt can affect growing conditions for many kinds of trees. Honeylocust is a tree that is very tolerant of many soil conditions, as well as salt.

Have students refer to the "Key to Ideal Site Conditions" at the bottom of the Tree Information Sheet and identify a tree that requires a wet soil to grow...one that is tolerant of many different soil conditions.

• **Light:** Another important environmental factor to consider is the amount of light the tree needs to grow. Some tree species, like white birch and most pines, require full sunlight to grow. Other tree species are more shade tolerant. Do not make the mistake of planting a tree where it is mismatched with its need for light.

Ask students to look at the "Key to Ideal Site Conditions" at the bottom of the Tree Information Sheet. Ask students to identify a tree that needs full sun ...one that is shade tolerant.

• Other environmental factors include other weather conditions like high **winds**, **soil compaction**, and **air pollution** (some species are very sensitive to chemicals in the air).
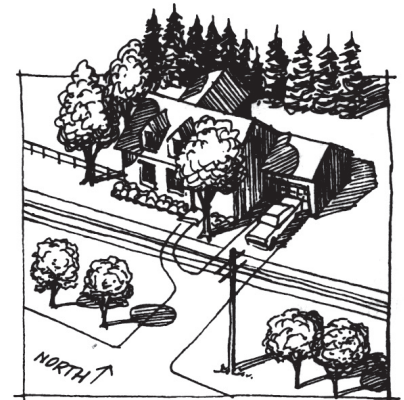
Plant the Right Tree in the Right Place

Wrong Trees, Wrong Places
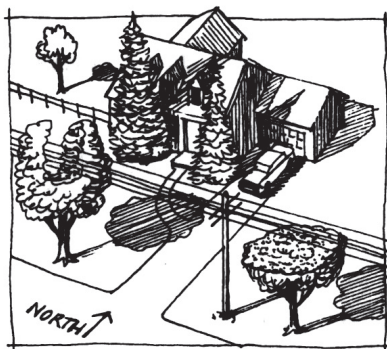
- Large trees planted under utility lines can interfere with lines
- Evergreens planted too close to the house can block warming winter sunlight and restrict views
- Avoid planting shade trees near a garden
- Be careful not to plant a large tree near a chimney

Better Choices

- Short flowering trees don't grow up into over head lines
- Large deciduous trees on the southeast, southwest, and west provide cooling shade in summer and don't block the low winter sun helping warm your home
- An evergreen windbreak on the north blocks cold winter winds and provides a home for wildlife

Concept #4: A greater diversity of trees means a greater diversity of wildlife.

Background: Trees play an important role in the web of life that exists in a rural or urban forest. They provide food and shelter to many kinds of animals. Certain tree species can determine the insect, bird, and even some **mammal** populations that exist in the area. Without that tree the dependent animal would not be present.

Proper selection of trees and plants can provide beauty and shade and, at the same time, provide a haven for wildlife. The presence of wildlife can make a backyard, schoolyard, or park a special place for you and your family. As urban and suburban development displaces many birds and animals from their natural habitat, it becomes increasingly important for people to provide mini-sanctuaries for birds and other wildlife. When selecting trees to plant that benefit wildlife be sure to select trees that provide for their needs.

Trees that provide food: A diversity of trees with high food value for wildlife is the single best way to bring wildlife close by. Students should be reminded that when selecting trees to plant for wildlife they should consider a wide variety of trees so there will be food for the animals year round. Some tree species produce seeds in the spring, other species produce their seeds and fruits in the summer or fall. Some trees keep fruit on the branches into the winter. Select species that produce high food value seeds, berries, nuts and acorns.

Trees that provide cover and shelter: Birds and small animals need concealed places for nesting and hiding, protected from the eyes of predators. Planting **conifers** (**evergreens**) in groups, growing hedges with low branches, and using prickly or thorny plants in a few areas are all ways to provide wildlife cover and habitat.

Using their Tree Information Sheets, have students identify some of the tree species that are most beneficial to wildlife.

Ask students what kinds of wildlife they would like to attract.

What are some of the benefits and disadvantages of attracting wildlife?

An example could include the fun of bringing many species of birds to your backyard versus problems with attracting large numbers of birds to city streets where bird droppings get on parked cars and business signs.

Concept #5: Tree diversity provides beauty and interesting variety.

Background: Trees provide beauty and add value to a landscape. Trees simply make our lives more pleasant.

Ask students to describe the benefits we get from trees. Record the responses on the board. If not mentioned by the students, include the benefits listed below.

Trees line our streets, cool our air, trap dust, muffle noise, shield us from wind, shade our parks, screen unattractive sites, and bring wildlife to our backyard. Trees also provide social benefits. Hospital patients have been shown to recover from surgery more quickly when their room has a view of trees.

Some tree species have showy spring flowers; others have spectacular fall color. Certain trees have tasty fruit while others have fragrant needles or leaves. Planting different kinds of trees enhances the community landscape throughout the year.

Have the students once again refer to the Tree Information Worksheet. Have them look at the diversity among the leaf shapes and the fruit produced by different trees. Ask them to describe the shapes of the various leaves. Ask students to think about what tree, or trees, they would most like to play under... or view from a window... and why.

THE ACTIVITY:
Design a healthy, diverse community forest

Provide the opportunity for students to apply information learned by designing a community forest landscape plan.

Pass out the Tree Selection Sheet and the Community Landscape Plan Worksheets (pages 16 -17). Using data from the Tree Information Sheets and recalling the previously discussed concepts, students are to determine what tree to plant in each lettered location. Students should cut the selected trees from the Tree Selection Sheet and glue them at the tree planting site they have chosen. Remind students that many different trees might work in some of the sites - but just select one tree for each site.

Some trees are suitable for several locations. Some trees, like the Lombardy poplar, should not be planted because of the current problems it has with disease.

When the landscaping projects are complete, ask students to explain their planting plans and their choice of tree locations.

Provide the opportunity for peer review and redesign.

ANSWER KEY
>   Site A: #3, #4, #5, #7, #8, #9, #12, #15, #16
>   Site B: #3, #4, #6, #8, #9, #11, #12, #15
>   Site C: #13, #14
>   Site D: #1, #5, #10, #16
>   Site E: #12 is best,
>   #3, #4, #8, #9, #10 are acceptable
>   Site F: #5, #10, #16 are best;
>   #1 acceptable
>   Site G: #6, #9, #11, #12, #15 are best;
>   #8 is acceptable
>   Site H: #7 is best;
>   #3, #4, #6, #8, #9, #10, #12 are acceptable
>   Site I: #3, #4, #8, #9, #12
>   Site J: #8, #14, #15, #16

Assessments:

Assessment Rubric:
Hand out a copy of the rubric (page 13) or put the rubric on the board at the start of the activity so students clearly understand the measured objectives.

Alternative Assessment:
Ask students to look at tree plantings around the school building. Determine if these trees were good choices for the sites in which they were planted.

Activity Adaptations:
You can adapt this Basic Activity for students with special needs by asking those students to draw an enlarged picture of the park site (site G) and select one or more trees from Tree Information Sheets A & B to "plant" in the park. They can choose to cut and paste trees from the Tree Selection Sheet OR they may draw and color in their own trees by looking at the illustrations on the Information Sheets. Students should label the trees in their picture and be able to describe why they picked the trees they did during the class discussion.

Extension Activites:

Many of the trees used in the Basic Activity are tree species commonly planted across much of the United States. However not all may be tree species that are well suited to your local environment. It is important for students to recognize some trees common to their own region. Two extension activities are available for you to extend your students' interest and learning.

• **Tree Selection Game** is found on pages 18-20. It can be used as a follow-up to **Create a Classroom Forest,** (below) or used as a fun way to reinforce concepts introduced in the Basic Activity.

• **Create a Classroom Forest** is an activity designed to introduce the basics of classification and help familiarize students with trees common to their region. Students first head outside to observe the diversity of trees in their own community. Then they select a local tree species to research, compiling what they have learned into a class Tree Information Worksheet (similar to the one used in the Basic Activity). Finally, using measuring skills and a representative scale, students design a proportional forest in the classroom that reflects the tree diversity in their community. You can find this activity on the Foundation's Web site at arborday.org/classroomforest.

Tree Clue Sheet

Use this page to gather clues about a specific tree. Look closely before checking your responses. The tree will be either conifer OR broadleaf. Check only one set of responses.

❏ Conifer:
(cone-bearing)

❏ Broadleaf:
(Deciduous)

Leaves (Conifer)

___ NEEDLE

___ SCALE

SHAPE:
____ round
____ flat
____ triangular
____ square

NUMBER IN BUNCHES:

____ 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 or more

TEXTURE:
____ stiff
____ sharp tip
____ limber
____ blunt tip

LENGTH: _____ inches long

Leaves (Broadleaf)

ATTACHMENT:
___Simple (single-blade)
___Compound (more than 1 blade)
___ palmate (like a hand)
___ pinnate (like a feather)
___ bipinnate (2 x like a feather)

ARRANGEMENT:
___Opposite
___Alternate

LEAF MARGINS:
_____ lobed
_____ entire
_____ toothed

LEAF SHAPE:
____ triangular
____ egg shaped
____ mitten shaped
____ round
____ fan shaped
____ heart shaped
____ 5-pointed star
____ pear shaped
____ lance shaped
____ cross shaped

Tree Shape

❏ Columnar
(tall and thin)

❏ Pyramidal
(triangular)

❏ V-Shaped

❏ Round

❏ Vertical
Oval

❏ Horizontal
Oval

Branching Patterns

OPPOSITE ❏
(branches across from
each other at same
level)

ALTERNATE ❏
(branches on a dif-
ferent level)

WHORLED ❏
(three branches at
same level)
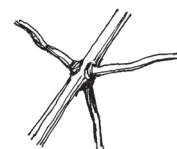
Seeds, Fruiting Bodies, Flowers

(Use the back of this sheet to describe or draw the flower or seed
body, if it is present. Write down any special characteristics these
have, including color, texture, and shape.)

Bark

COLOR:
____ brown ____ reddish
____ grey ____ white
____ black

TEXTURE:
____ smooth ____ deep
____ ridged ____ shallow

PATTERN:
____ diamond
____ horizontal
____ vertical

ATTACHMENT:
____ tight
____ loose

Vocabulary

Broadleaf – a tree with thin, flat leaves that produces flowers and fruit
Capsule – a sack or pod containing seeds
Catkin – a cluster of many tiny flowers on a stem or stalk
Conifer – a tree with needle-like or scale-like leaves that bears (grows) cones
Crown – the top or head of a tree
Deciduous – shedding all leaves each year
Diversity – differing from each other, a variety
Evergreen – holding on to leaves through the winter
Gall – a swelling on a plant often caused by insects
Growth Rate - how quickly a tree grows
Hardy – tough, able to stand poor or harsh conditions
Hardiness Zone – The range of soil and weather conditions in which a tree can successfully grow
Ideal - perfect
Landscape Plan - a planned drawing of plants in a particular area
Mammal – a warm-blooded animal, often with hair or fur, whose babies are born alive and fed with mother's milk. (Examples: raccoon, deer, squirrel, mouse, bear, human.)
Species - a kind or sort
Spread – the width of a tree's crown
Street tree – a tree planted near the street, often cared for by the city
Windbreak – a group of trees planted to act as a shelter from the wind

RUBRIC - Design a healthy, diverse community forest

| 0-2 POINTS POOR PLAN	3-5 POINTS AVERAGE PLAN	6-8 POINTS GOOD PLAN	9-10 POINTS EXCELLENT PLAN
❏ Less than 6 trees are "planted" in sites on the Worksheet.	❏ 6 or 7 trees are "planted" in sites on the Worksheet.	❏ 8 or 9 trees are "planted" in sites on the Worksheet.	❏ 10 trees are "planted" in sites on the Worksheet.
❏ Less than 6 trees in your plan fit the described site needs.	❏ 6 or 7 trees in your landscape plan fit the described sites needs.	❏ 8 or 9 trees in your landscape plan fit the described site needs.	❏ All 10 trees in your landscape plan fit the described site needs.
❏ You cannot clearly explain why trees were selected for sites **A-J**.	❏ You can explain why some trees were selected for at least 6 sites **A-J**.	❏ You can explain clearly why each tree was selected for at least 8 sites **A-J**.	❏ You can very clearly explain why each tree was selected for each site **A-J**.
❏ You do not participate in the class discussion of landscaping plans.	❏ You participate a little in class discussion of landscaping plans.	❏ You participate actively in class discussion of landscaping plans.	❏ You actively participate in the class discussion of landscaping plans.
❏ You make little effort to improve your landscape plan after discussion.	❏ You make some effort to improve your landscape plan after class discussion.	❏ If needed, you make good improvements in your landscape plan after class discussion.	❏ If needed, you make good improvements in your landscape plan after class discussion.
❏ Your final landscape plan does not create a healthy, diverse community forest.	❏ Your plan is a start toward creating a healthy, diverse community forest.	❏ Your plan results in a healthy, diverse community forest.	❏ Your plan results in a very healthy, diverse community forest.

Tree Information Sheet — Side A

① Douglasfir

Height: tall
Spread: 20 feet
Growth Rate: medium
Fruit: cone
Comments: an important timber tree; can grow to over 200' in a natural setting.
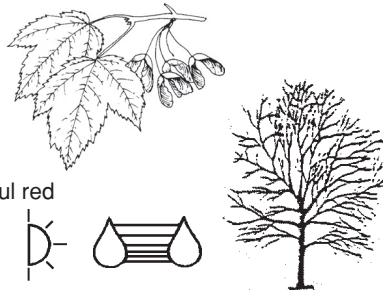Value to Wildlife: medium
Attracts: birds, mammals
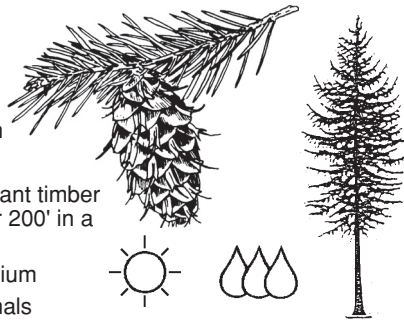
② Lombardy Poplar

Height: tall
Spread: 10 to 15 ft.
Growth Rate: fast
Fruit: no fruit, male clones
Comments: has serious problems with insect pests.
Value to Wildlife: low
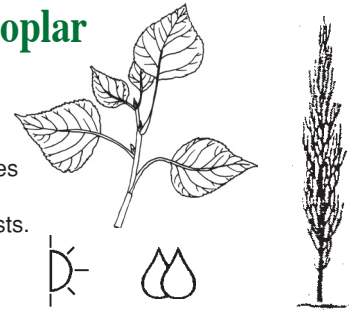
③ Red Maple

Height: medium
Spread: 40 feet
Growth Rate: medium
Fruit: winged seed
Comments: has beautiful red fall color.
Value to Wildlife: low

④ Ginkgo

Height: medium
Spread: 30 to 40 ft
Growth Rate: medium
Fruit: naked, smelly seed
Comments: yellow fall color. Because of smelly fruit, plant male trees.
Value to Wildlife: low
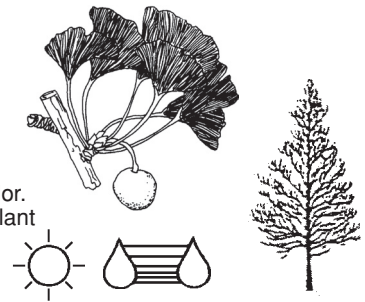
⑤ Norway Spruce

Height: medium
Spread: 25 feet
Growth Rate: medium
Fruit: cone
Comments: ideal windbreaker
Value to Wildlife: low
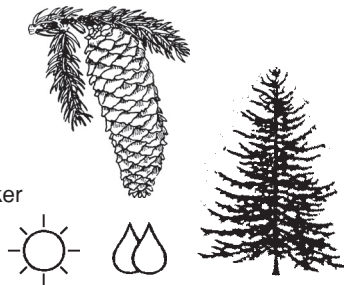
⑥ White Oak

Height: tall
Spread: 60 to 80 ft
Growth Rate: slow
Fruit: acorn
Comments: a majestic tree, it does not do well in city conditions.
Value to Wildlife: high
Attracts: birds, mammals
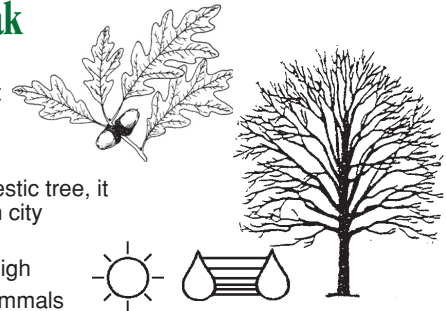
⑦ Weeping Willow

Height: medium
Spread: 35 feet
Growth Rate: medium
Fruit: small capsule
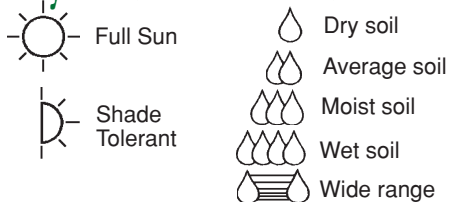Comments: graceful tree with ground sweeping branches.
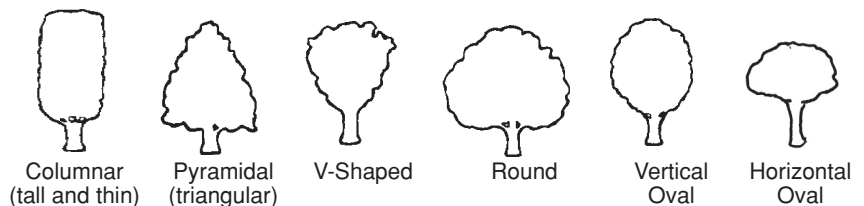Value to Wildlife: low

⑧ Green Ash

Height: medium
Spread: 25 feet
Growth Rate: Fast
Fruit: winged seed
Comments: very hardy tree, leaves turn yellow in fall.
Value to Wildlife: Low to medium
Attracts: birds

Key to Ideal Site Conditions:

- Full Sun
- Shade Tolerant
- Dry soil
- Average soil
- Moist soil
- Wet soil
- Wide range

Key to Tree Shapes:

- Columnar (tall and thin)
- Pyramidal (triangular)
- V-Shaped
- Round
- Vertical Oval
- Horizontal Oval
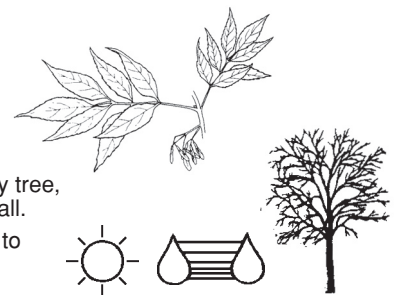
Tree Information Sheet — Side B

⑨ Hackberry

Height: medium

Spread: 50 feet

Growth Rate: fast

Fruit: hard, berrry-like seed

Comments: grows easily, leaves sometimes get wart-like galls.
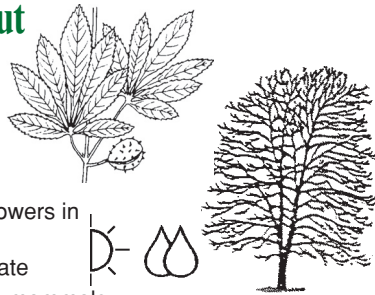
Value to Wildlife: high

Attracts: birds, small mammals
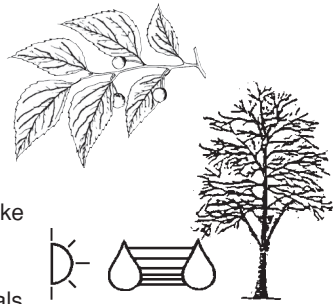
⑩ Eastern White Pine

Height: tall

Spread: 50 feet

Growth rate: fast

Fruit: cone

Comments: soft needles in bundles of five.
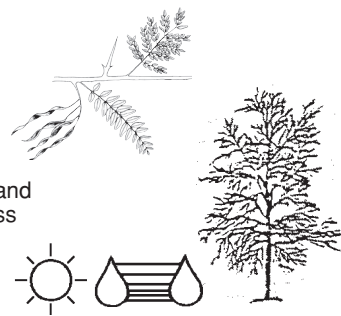
Value to Wildlife: moderate

Attracts: birds, mammals

⑪ Horsechestnut

Height: tall

Spread: 40 to 70 ft.

Growth Rate: medium

Fruit: spiny capsules with nuts

Comments: has white flowers in the spring.

Value to Wildlife: moderate

Attracts: small and large mammals

⑫ Honeylocust

Height: medium

Spread: 50 feet

Growth Rate: fast

Fruit: pod

Comments: tolerant of salt and most soils. Select a thornless variety for planting.

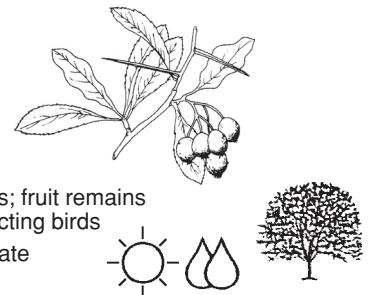Value to Wildlife: moderate

Attracts: large mammals

⑬ Redbud

Height: short

Spread: 20 to 30 ft.

Growth Rate: medium

Fruit: pod

Comments: has pretty purple blooms in spring.

Value to Wildlife: low
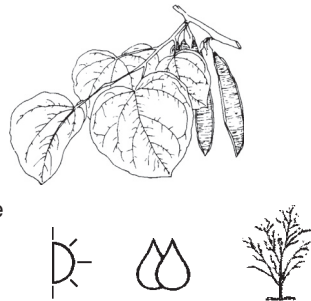
⑭ Hawthorn

Height: short

Spread: 25 feet

Growth Rate: slow

Fruit: berry

Comments: sharp thorns; fruit remains on tree into winter, attracting birds

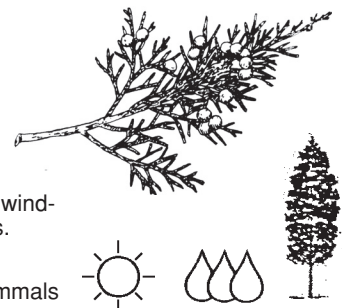Value to Wildlife: moderate

Attracts: birds

⑮ White Birch

Height: medium

Spread: 25 feet

Growth Rate: medium/fast

Fruit: catkin

Comments: has lovely white bark; often grown in groups.
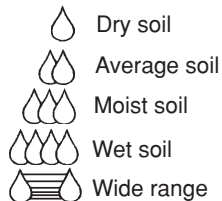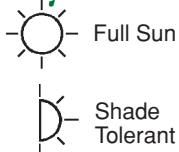
Value to Wildlife: medium
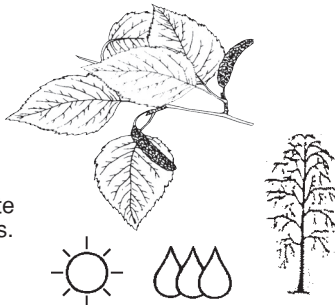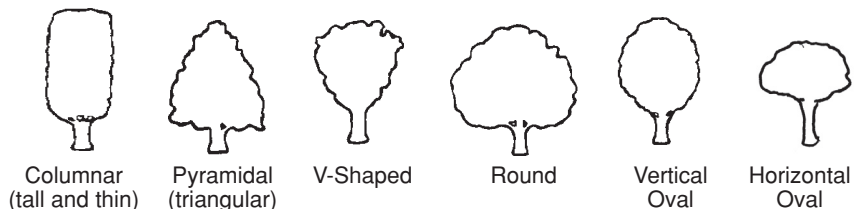
Attracts: birds

⑯ Redcedar

Height: medium

Spread: 20 feet

Growth Rate: medium

Fruit: berry-like cone

Comments: excellent for wind-breaks; birds love berries.

Value to Wildlife: high

Attracts: birds, small mammals

Key to Ideal Site Conditions:

☼ Full Sun

◗ Shade Tolerant

◊ Dry soil

Average soil

Moist soil

Wet soil

Wide range

Key to Tree Shapes:

Columnar (tall and thin)

Pyramidal (triangular)

V-Shaped

Round

Vertical Oval

Horizontal Oval

Tree Selection Sheet

Assignment: Imagine you are helping a new community develop a landscape plan that will result in a healthy, diverse community forest. Look at the Community Landscape Plan Worksheet. Notice the holes that have already been dug at sites A-J for trees to be "planted." Read through the list below and you'll see that each site has different conditions and different tree needs. Using what you've learned, as well as referring to Tree Information Sheets A & B, select what you think is the best tree to "plant" in each site (Sites A-J) on the Community Landscape Plan Worksheet.

Cut out the trees you select and lightly tape or paste them in the site locations on the Worksheet. Be able to explain why you selected each tree and planted it where you did. (Several different trees may work in <u>some</u> sites – but just select one tree for each site.)

Site A — Needs a medium-sized tree that will grow well in a front yard.

Site B — Needs a tree tall enough to provide shade and leave room near the ground for children to play in a backyard.

Site C — Needs a street-side tree that will fit under a power line.

Site D — Needs an evergreen that holds its leaves year round.

Site E — Needs a tree that can tolerate poor soil and salt from winter de-icing in a parking lot.

Site F — Needs a tree that can help break the wind just west of a farmhouse

Site G — Needs a medium or tall shade tree under which people can picnic and relax that will also benefit wildlife.

Site H — Needs a tree that will grow in wet soil near a wetlands area.

Site I — Needs a medium-sized tree that will grow in a variety of soil conditions
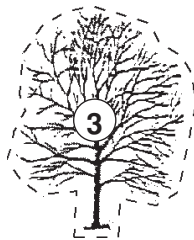
Site J — Needs a tree that will attract birds to a narrow space outside a class room window.

✂ --
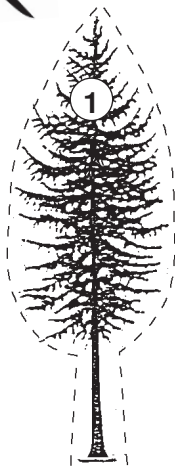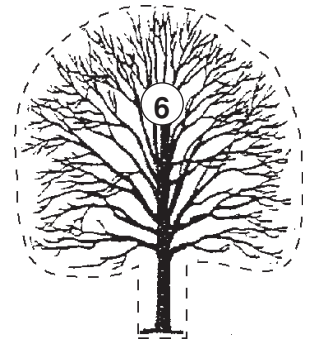
1–DOUGLASFIR

2–LOMBARDY POPLAR

3–RED MAPLE

4–GINKGO

5–NORWAY SPRUCE
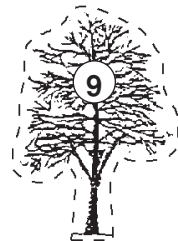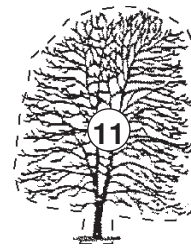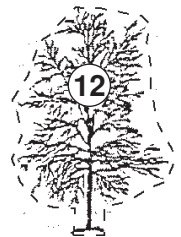
6–WHITE OAK

7–WEEPING WILLOW

8–GREEN ASH

9–HACKBERRY

10-EASTERN WHITE PINE

11–HORSE-CHESTNUT

12–HONEY-LOCUST

13–REDBUD

14–HAWTHORN

15–WHITE BIRCH
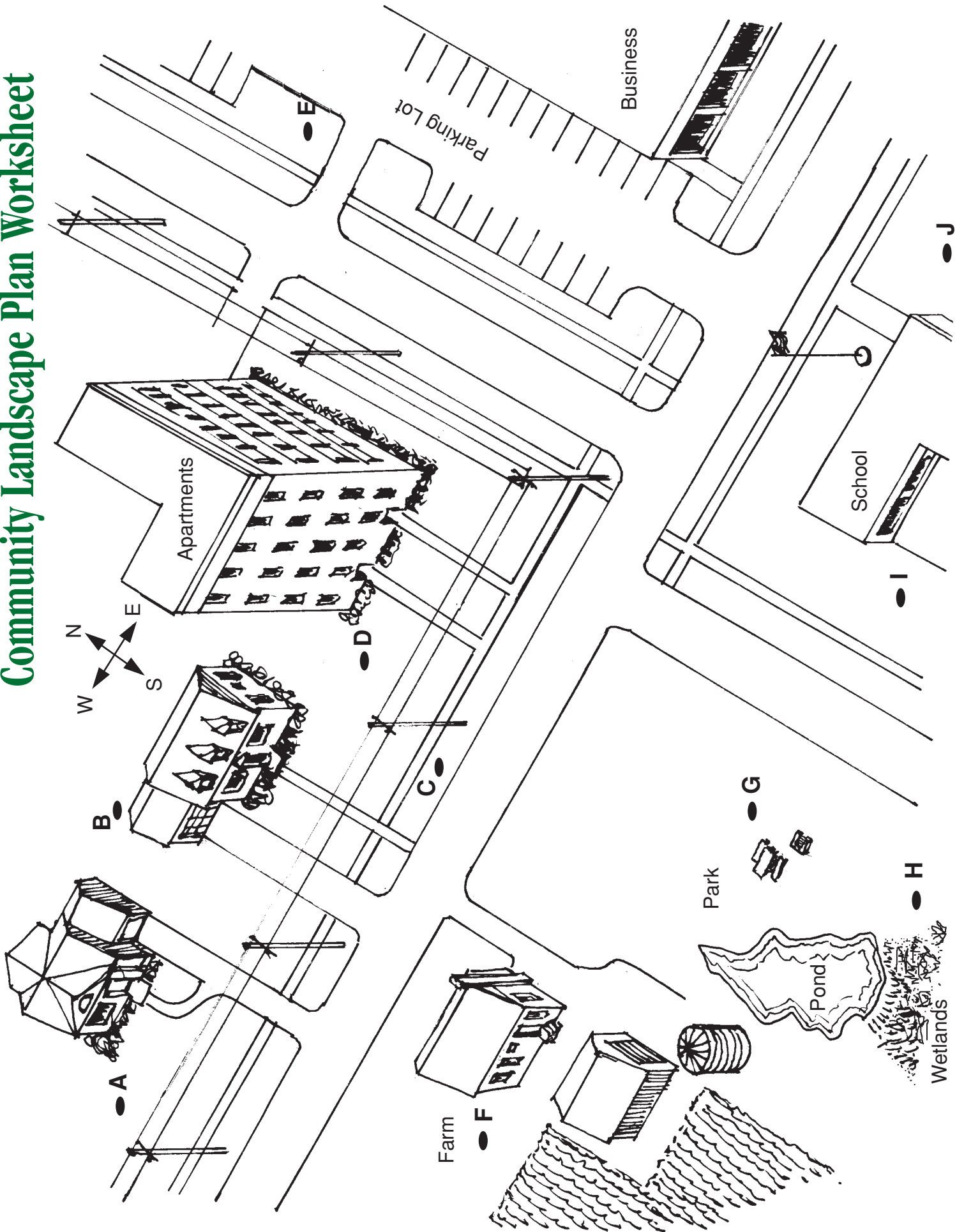
16–REDCEDAR

Community Landscape Plan Worksheet

Apartments

Business

Parking Lot

School

Park

Pond

Wetlands

Farm

N
E
W
S

A
B
C
D
E
F
G
H
I
J

Step 1

EXTENSION ACTIVITY - Tree Selection Game

Objective:

- **Students will research trees common to their community and evaluate how some of their region's environmental conditions affect tree diversity in different tree planting situations.**

Time Recommended:

- **60 minutes**

Materials Needed:

- **Worksheet (page 20) • one copy per pair**
- **Scissors**
- **Glue**
- **Pencil & chart paper**
- **Assorted tree reference books and/or Internet access**
- **1 paper sack per pair of students**

National Science Education Standards Correlation:

- **Diversity and adaptations of organisms**

Advance Preparation:

Create a list of 15 trees common to your area. If you are unfamiliar with your region's trees, check with your local forester or visit arborday.org/pc/regionaltrees to find a listing of trees common to general areas of the United States.

If few trees species are common to your area, or if class time is limited, use the trees listed on the Tree Information Sheets (pages 14-15). Write the name of each tree on a separate slip of paper.

Background Information:

Helpful tree-related websites and books that your students can utilize are listed in the box on page 19. Some references that students use may list a hardiness zone range for different tree species. Visit arborday.org/zones to view the ArborDay.org Hardiness Zone Map which shows the country divided into regions based on temperature. Many factors

affect tree survival but these zones can help determine if a particular tree species is likely to survive the climate where you live. You may wish to refer to this map and share your area's hardiness zone with your students as they conduct their tree research.

Instructional Sequence:

Divide students into pairs. Provide a sheet of paper, one copy of the Tree Selection Game worksheet (page 20) and one paper sack per pair. Have each pair draw the name of one tree to research from the slips of paper prepared earlier. Using available resources, allow students 15 minutes to collect the following information about their assigned tree and write it on their chart paper. (See four topic areas below.)

1. **Tree function.** (Is it a shade tree, a windbreak tree, a hardy tree, or a tree planted for its beautiful blooms or leaf color?)
2. **Attraction to wildlife.** (What kinds of animals depend on this tree for food or shelter?)
3. **Size at maturity.** (What is the tree's expected height and spread? Small- under 30', Medium – 30 to 70', Tall – over 70')
4. **Soil conditions**. (What kind of soil & moisture conditions does the tree need?)

Post the completed tree information on the wall.

Instruct students to cut out the four Tree Selection Cards listed under the column "Tree Function." Have students put these cards in the paper bag and shake

Explore your community's trees with your students.

the bag. Students in each pair take turns pulling a card out of their bag, pasting down the cards in the Tree Function column of the Chart in the order they are drawn. Students can assign any Tree Function characteristic they wish to the Wild Card.

Repeat the process, column by column, for the three remaining groups. Again, students can assign any characteristic of that column to Wild Cards.

Once all pairs have their charts completed, explain that they are going to look at the information each team collected to see if they can find a tree that fits all the tree characteristics in each row.
For example, if the first row reads:

Tree Function	Attraction to Wildlife	Size at Maturity	Soil Conditions	Tree Selected
Provides shade	Attract birds	Medium size: 31 to 70 feet	Wild card	Hackberry

Students then try to find a medium sized tree that provides shade, attracts birds, and grows in whatever soil type the students selected to represent the Wild Card. Hackberry would fit all of these characteristics.

Allow students 15 minutes to study the posted tree information. Once students identify a tree that fits all the characteristics in the row, they should write the name of the selected tree in the space provided on the chart. When completed, each group should have four trees identified on their chart.

Note: It is possible that with some combinations you may not have a tree common to your area that fits the listed requirements.

Each pair should select one row of their Tree Selection Game Chart to read to the class. Other students in class can try to guess what tree was found that fits all the characteristics. Discuss what tree characteristics were found, or not found, in your community's trees and speculate why.

Alternative Assessment: Have students work in pairs to write a value statement about the importance of diversity in a community forest.

Tree Information Web Sites

National Arbor Day Foundation: www.arborday.org/pc/regionaltrees and www.arborday.org/trees/treeguide
U.S. Department of Agriculture Plant Database: www.plants.usda.gov/
United States Forest Service: www.fs.fed.us/
University of Georgia collaboration: www.discoverlife.org/nh/
National Wildlife Federation: www.enature.com/guides/select_Trees.asp
Center for Plant Conservation: www.centerforplantconservation.org/ASP/CPC_PlantLinks.asp#90

Tree Reference Books

Field Guide to Trees and Shrubs by George Petrides (Houghton Mifflin) 1972
National Audubon Society Field Guide to North American Trees: Eastern Region and Western Region by Elbert Luther Little (Alfred Knopf) 2000
The Complete Trees of North America by Thomas Elias (Van Nostrand Reinhold) 1980
Trees of North America by C. Frank Brockman (Golden Press) 1986
Western Trees by George and Olivia Petrides (Houghton Mifflin) 1992
What Tree Is That? A Guide to the more common trees found in the Eastern/Central and Western United States (The National Arbor Day Foundation) 1999

Tree Selection Game

Tree Function	Attraction to Wildlife	Size at Maturity	Soil Conditions	Tree Selected

Tree Selection Cards

Tree Function	Attraction to Wildlife	Size at Maturity	Soil Conditions
Provides shade	Does not attract wildlife	Small size: 30 feet or less	Dry Soil
Provides shade	Attract birds	Medium size: 31 to 70 feet	Average or moist soil
Provides a privacy screen or creates a windbreak	Attracts many kinds of wildlife	Large size: Over 70 feet	Wet soils
Wild card	Wild card	Wild card	Wild card