Interdisciplinary

Curriculum Guidebook

Oak: A classic slow-growing tree known for hardiness and strength. It is also an excellent tree for wildlife as the acorns serve as great food for animals!	Maple: Known for incredible fall color and their sap is used to produce common items like maple syrup.	Ash: Currently the entire Ash species is suffering from the invasion of Emerald Ash Borer and the population of Ash trees is being devastated.

Elm: Infamous for the Dutch Elm Disease epidemic that wiped out most elms in the US. Now Elms are being genetically redesigned to withstand the disease.	Cottonwood: A tree identified by its overall shape and 3-inch to 5-inch long leaves with large curved tooth–like edges. Cottonwood is currently the largest tree in South Dakota!	Black Hills Spruce: The State Tree of South Dakota. Identifiable by its 4-sided needles and by its duller needles and pungent smell when crushed.

Trees are terrific…

In all shapes and sizes!

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This inter-disciplinary curriculum guidebook has been designed to correlate with all state and federal educational standards. The *"Trees are Terrific… in All Shapes and Sizes!"* guidebook provides all the necessary information, classroom exercises, and assessment guidelines you need to educate your students about the benefits of trees and their inherent value to communities, people, and environmental health.

The South Dakota Department of Agriculture and Natural Resources, Division of Resource Conservation and Forestry, along with the Dakotas Society of American Foresters, Aspen Arboriculture Solutions, and the South Dakota Arborist Association are sponsors of this program.

Step 1

Discover the importance of tree diversity in a community.

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 13-14.
⇒ 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*:**

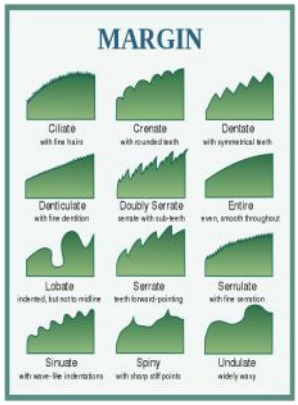
◊ Estimate distance, calculate scale, and distinguish other geographic relationships such as population density and spatial distribution patterns.
◊ Examine, interpret, and analyze physical and cultural patterns and their interactions, such as land use, settlement patterns, cultural transmission of customs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

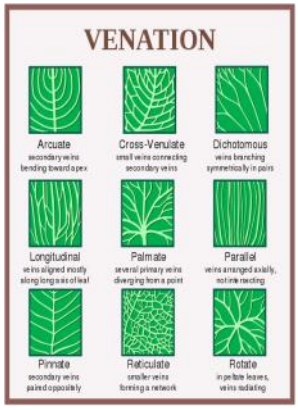
Instructional Sequence:

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 8) 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.





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Concept #1: Without a diversity (variety) of trees, one disease or insect could destroy all the trees in the 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 11-12) 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. 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 unfamiliar with any of the terms, define them as you progress through the concepts.

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

This is the Emerald Ash Borer.	This is the Gypsy Moth.

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.

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Step 1: Discover the importance of tree diversity in a community—BASIC ACTIVITY

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.

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.

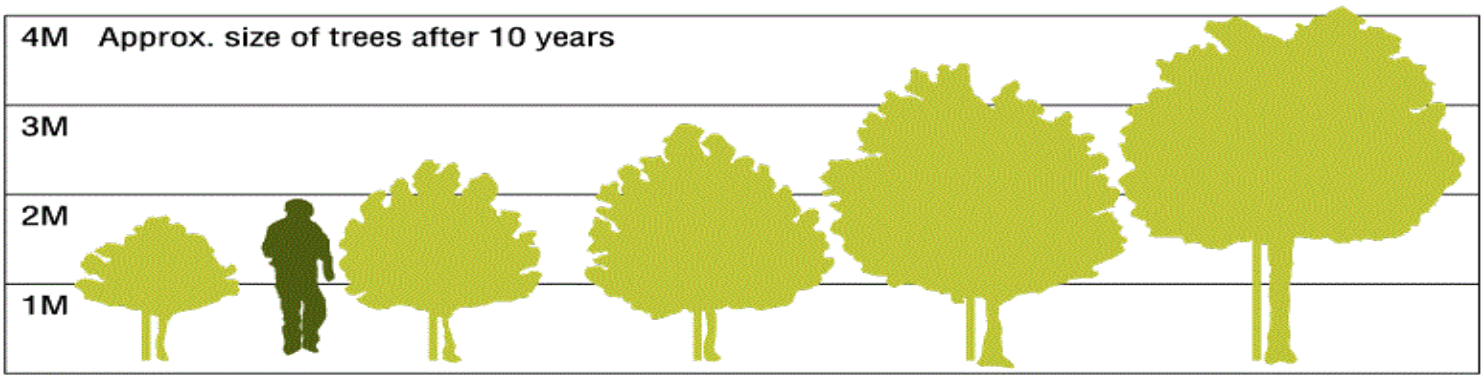
Trees Come in a Variety of Shapes

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.

Teachers 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!



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Concept #3: Selecting a micro-climate for trees

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.
- **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 trees.

Want to learn more? At www.arborday.org/zones the 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.

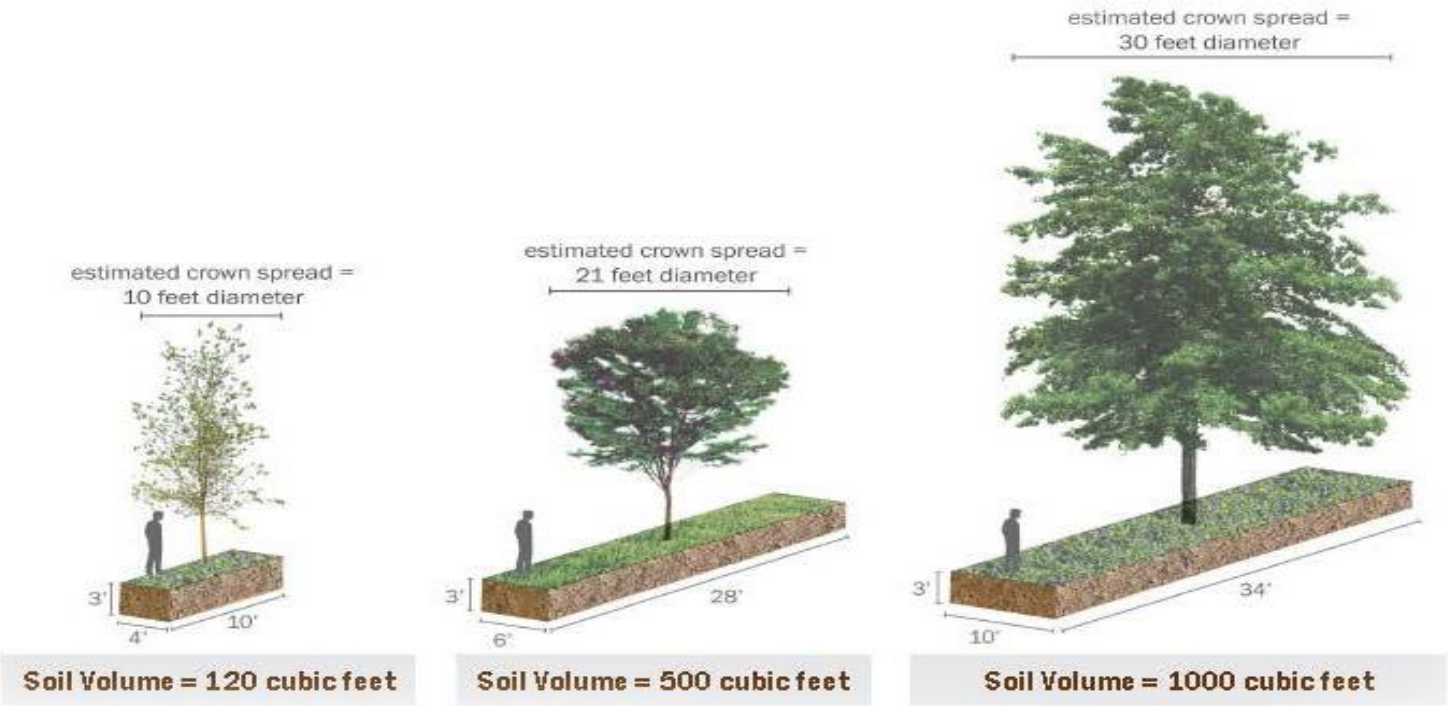
Honey locust is a tree that is very tolerant of many soil conditions, as well as salt.

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 a 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).



Step 1: Discover the importance of tree diversity in a community—BASIC ACTIVITY

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.

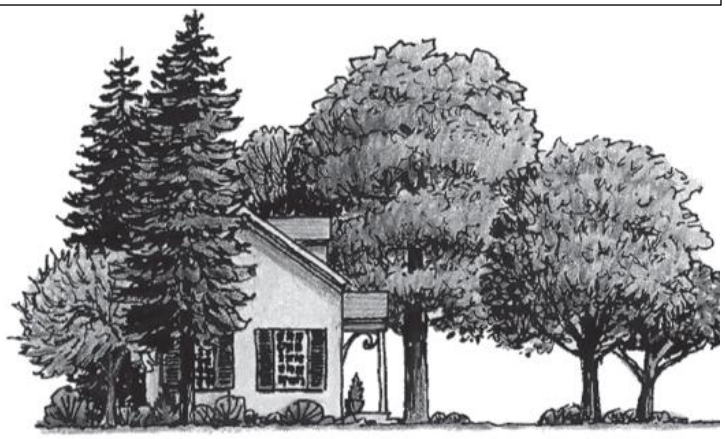
Background: Trees provide beauty and add value to a landscape. Trees simply make our lives more pleasant.

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.



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Assessment

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 13-14). 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 is 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 10) 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 Activities:

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 15-17. 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.

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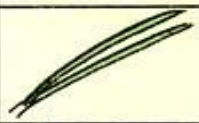
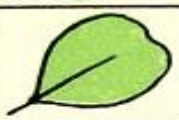
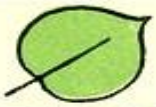
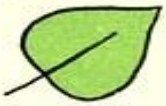
Tree Clue Sheet

OAK		Smooth	Opp.	D	OSIER WILLOWS		Smooth Toothed	Alt. Alt.	D D
BEECH HORNBEAM		Shiny Toothed	Alt. Alt.	D D	SALLOW CRAB APPLE		Smooth Toothed	Alt. Alt.	D D
BIRCH		Smooth Toothed	Alt.	D	PINE		Pairs	–	E
ALDER		Rough Toothed	Alt.	D	CEDAR LARCH		Bunches	- -	E D
LIME HAZEL		Smooth Toothed Rough Toothed	Alt. Alt.	D D	SPRUCE		Brush	-	E
ELM		Rough Toothed	Alt.	D	YEW		Spiky	-	E
ASH ROWAN		Smooth Toothed	Opp. Alt.	D D	HOLLY HOLM OAK		Shiny Leathery	Alt. Alt.	E E
SYCAMORE		Leathery	Opp.	D	BOX		Shiny	Opp.	E
Field MAPLE		Smooth	Opp.	D	WHITE BEAM		Toothed White under	Alt.	D
MAPLE PLANE		Smooth Leathery	Opp. Alt.	D D	WALNUT ELDER		Smooth Toothed	Opp. Opp.	D D
SWEET CHESTNUT		Shiny Toothed	Alt.	D	CHERRY BLACKTHORN		Smooth Toothed	Alt. Alt.	D D
HORSE CHESTNUT		Toothed	Opp.	D	MULBERRY		Shiny Toothed	Alt.	D
WHT. POPLAR		White under	Alt.	D	MEDLAR		Downy under	Alt.	D
BLK POPLAR ASPEN		Smooth Toothed	Alt. Alt	D D	HAWTHORN		Shiny	Alt.	D

Opp.= Opposite Alt.= Alternate E.= Evergreen D.= Deciduous

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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.
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 site 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 clearly explain why some trees were selected for at least 6 sites A-J	☐ You can very clearly explain why some trees were selected for at least 6 sites 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 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
☐ 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

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Tree Information Sheet—Side A

① Douglas Fir

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 16 feet
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 feet
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 feet
Growth Rate: slow
Fruit: acorn
Comments: a majestic tree, it does not do well in city conditions.
Value to Wildlife: low to medium
Attracts: birds

⑦ Weeping Willow

Height: medium
Spread: 35 feet
Growth Rate: medium
Fruit: 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

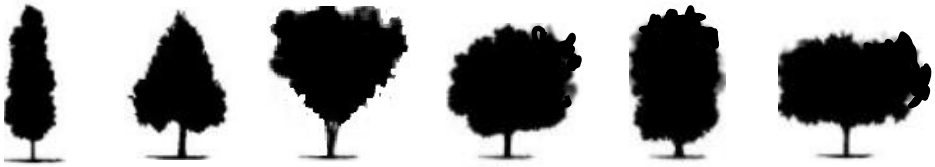
Key to Ideal Site Conditions:

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: 60 feet
Growth Rate: fast
Fruit: hard, berry-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: 60 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 feet
Growth Rate: medium
Fruit: spiny capsules with nuts
Comments: has white flowers in the spring
Value to Wildlife: small and large mammals

⑫ Honey Locust

Height: medium
Spread: 60 feet
Growth Rate: fast
Fruit: pod
Comments: tolerant of salt and moist soils. Select a thornless variety.
Value to Wildlife: moderate
Attracts: large mammals

⑬ Redbud

Height: short
Spread: 20 to 30 feet
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.
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

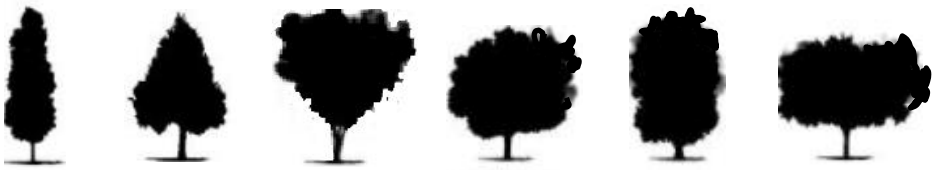
⑯ Red Cedar

Height: medium
Spread: 20 feet
Growth Rate: medium
Fruit: berry
Comments: excellent for windbreaks, 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 that different trees need. 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 Forestry 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 classroom window.

Douglas Fir

Lombardy Poplar

Red Maple

Ginkgo

Norway Spruce

White Oak

Weeping Willow

Green Ash

Hackberry

Eastern White Pine

Horse-chestnut

Honey Locust

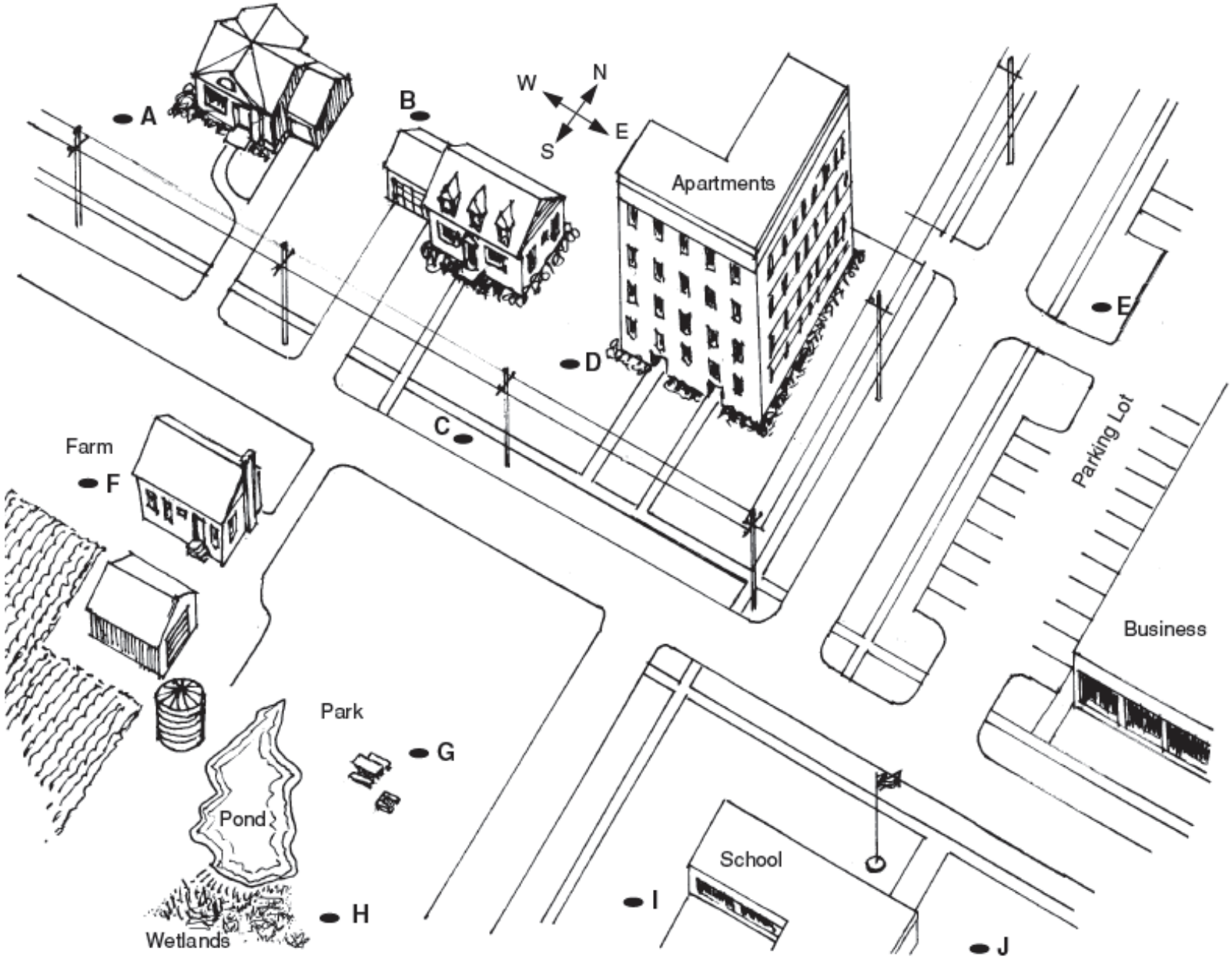
Redbud

Hawthorn

White Birch

Red Cedar

Community Landscape Plan Worksheet



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Step 1 Discover the importance of tree diversity in a community.

ADDITIONAL ACTIVITY—Tree Selection Game

Classroom Activity:

⇒ Students will design a diverse community forest landscape plan

Objectives:

⇒ 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 - one copy per pair
⇒ Scissors
⇒ Glue
⇒ Pencil & chart paper
⇒ Assorted tree reference books and/or internet access
⇒ 1 paper sack per pair of students

Advanced Preparation:

Create a list of 10 trees common to your area. If you are unfamiliar with your region's trees, check with your local forester or visit arborday.org/pc/regional trees 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 11-12). 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 14. 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.

Instructional Sequence:

Divide students into pairs. Provide a sheet of paper, one copy of the Tree Selection Game worksheet (page 17), 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 complete 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 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.

Explore your community's trees with your students.

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Once all pairs have their cards 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.

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.

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

Tree Information Web Sites

* National Arbor Day Foundation: www.arborday.org/trees/treeguide
* U.S. Department of Agriculture Plant Database: www.plants.usda.gov/
* United States Forest Service: www.fs.fed.us/
* South Dakota Department of Agriculture and Natural Resources, Division of Resource Conservation and Forestry: https://danr.sd.gov/Conservation/Forestry/Education/default.aspx

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Tree Selection Game

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

Tree Selection Game

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

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Step 2 Create a Poster

Tree are Terrific … in all Shapes and Sizes!

Objectives:

⇒ Students will create a poster that reflects their understanding of a healthy diverse forest.

Deadline:

⇒ Make certain that your school winner meets the entry deadline as stated in the enclosed cover letter or contact your state coordinator listed on page 18.

Time Recommended:

⇒ A minimum of one class period is recommended.

Materials needed:

⇒ Paper no smaller than 8 ½" x 11" and no larger than 14" x 18"

⇒ Markers, crayons, colored pencils, paint pens, watercolor, ink, acrylic, and/or tempera paint.

National Art Education Achievement Standards:

⇒ Students generalize about the effects of visual structures and functions and reflect upon these effects in their own work.

⇒ Students employ organizational structures and analyze what makes them effective or not effective in the communication of their ideas

⇒ Students select and use the qualities of structures and functions of art to improve communication of their ideas

⇒ Students integrate visual, spatial, and temporal concepts with content to communicate intended meaning in their artworks.

Instructional Sequence:

Ask each student to create a poster that reflects his or her understanding of the importance of a healthy, diverse community forest. Before they create their poster, encourage students to think about the variety of tree shapes and functions.

Students should make sure their poster follows the contest rules by using the checklist on page 19. You may select the winner or have a judging panel for the classroom and school contest. Judges could include other students, garden club members, nursery personnel, arborists, the city forester, teachers, PTA members, or individuals with an interest in trees who are willing to volunteer some time.

Poster Contest State Prizes

First Place

» $125 cash prize

» Certificate of Achievement

» Special recognition and poster distributed across the state

» Poster featured in the annual South Dakota Arbor Day Poster Contest Calendar

» Winning student's teacher gets $175 for supplies for the classroom

Second Place

» $100 cash prize

» Certificate of Achievement

» Poster featured in the annual South Dakota Arbor Day Poster Contest Calendar

Third Place

» $75 cash prize

» Certificate of Achievement

» Poster featured in the annual South Dakota Arbor Day Poster Contest Calendar

Fourth—Twelfth Places

» Certificates of Achievement

» Posters featured in the annual South Dakota Arbor Day Poster Contest Calendar

Poster Contest Rules

Use this checklist to make certain all entries are eligible for judging. Entries not meeting these guidelines will be disqualified.

- ☐ 1. **Eligibility**: All South Dakota 5th grade students are eligible to enter their schools' poster contests. *Each school may submit only one poster to the State Arbor Day Poster Contest*.
- ☐ 2. **Originality**: Posters must be original. Copyrighted cartoon characters, TV figures, and photographs are not acceptable.
- ☐ 3. **Medium**: Posters may be drawn in marker, crayon, colored pencil, paint pens, watercolor, ink, acrylic or tempera paint. Bright colors that reproduce well are best.
- ☐ 4. **Presentation**: Posters may be on poster paper or drawing paper. The posters will not be accepted for judging if they are matted, framed, or laminated. Posters must be flat and it is preferred that the posters not be folded or rolled.
- ☐ 5. **Size**: Posters cannot be smaller than 8½" x 11" and cannot be larger than 14" x 18". Oversized or undersized posters will not be accepted.
- ☐ 6. **Theme**: Include the theme, "*Trees are Terrific . . . In All Shapes and Sizes!*" in the poster design. The theme must be free drawn and spelled correctly. Stencils, computer-generated text, clipart, collages, and press-on letters are not acceptable.
- ☐ 7. **Signatures**: Posters must be signed by the student in the lower right-hand corner on the front of the poster with the Student's first and last name.
- ☐ 8. **Entry Forms**: Complete one School Report Form (page 20) and attach it to the back of the poster.
- ☐ 9. **Posters will not be returned because of mailing costs**. If you would like your school's posters back, they will have to be picked up or other arrangements made. Posters will be discarded on June 30, 2022.

Posters Are Due: March 25, 2022

The 2021 South Dakota Arbor Day Poster Contest winning art by Abby Johanneson who attends Sacred Heart School in Yankton.

Please Mail Posters To:

John Hartland
Department of Agriculture and Natural Resources
4305 S Louise Ave, Suite 107
Sioux Falls, SD 57106

The 2020 South Dakota Arbor Day Poster Contest winning art by Sienna Vera Weiman who attended Sacred Heart School in Yankton.

School Winner Report Form

After selecting a school winner, copy and complete this form, attach it to the back of the poster, and send it to your contest coordinator (John Hartland. 4305 S Louise Ave, Suite 107, Sioux Falls, SD 57106).

2022 School Winner Report Form

(All information should be complete to expedite contact of winners.)

Winner's Name:_____

Winner's Home Address:_____

City:_____ State:_____ Zip:_____

Winner's Parent or Guardian Name:_____

Teacher's Name:_____

Teacher's E-mail Address:_____

School Name:_____

School Address:_____

City:_____ State:_____ Zip:_____

School Phone:(_____)_____

Important:

Please indicate the number of posters entered or drawn in the school contest in the box to the left.

Number of teachers in school who participated.

*** All artwork becomes the property of contest sponsors.**

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Arbor Day Poster Contest

2022

Certificate of Participation

Has created an artistic representation of the importance of trees to environmental stewardship.

Gregory J. Josten
State Forester

Teacher

Arbor Day Poster Contest

2022

School Winner

_____

Has created an outstanding artistic representation of the importance of trees to environmental stewardship.

_____ _____

Gregory J. Josten
State Forester

Teacher

Step 3 Celebrate Arbor Day

Get your students outside and celebrate Arbor Day!

Since 1872, Arbor Day has been celebrated throughout the United States and Arbor Day celebrations in schools have always played an important role.

An Arbor Day celebration can be:

- **Simple**—Plant a tree in honor of your school poster contest winner or to recognize an outstanding volunteer.
- **Inspiring**—Have your graduating class plant a tree with the younger students. This is a tradition that honors the students leaving and gives new students something to enjoy throughout their years.
- **Entertaining**—Students could compose poems about trees or perform an Arbor Day play (a sample play is available at www.arborday.org/arbordayplay). This could be performed for fellow students, families, or senior citizens.

Whatever you choose for your celebration—go outside and enjoy the trees and environment that surround you!

State Tree

Black Hills spruce

(*Picea glauca var. densata*)

Black Hills spruce is a naturally occurring variety of white spruce native to South Dakota. It is more compact and slower growing than its northern cousin, white spruce. Also, its needles are more dense and are darker in color, varying from bright green to bluish green. It was first seen by French explorers in 1743.

Black Hills spruce ranges from 30-60 feet in height and 15-25 feet in width. The tree is fairly drought resistant and prefers full sun exposure. It makes a good yard or ornamental tree and is good winter cover for birds and other wildlife.

Black Hills spruce was adopted as the official State Tree of South Dakota by the State Legislature on March 10, 1947.

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