

CITY OF ABILENE
TREE BOARD
MEETING AGENDA

October 27, 2015

at 5:30 p.m.

Abilene Public Library ~ Jordan Room
209 NW 4th St.

Agenda Item
Call to Order – Welcome.
Approval of Agenda.
Approval of the Meeting Minutes – September 22, 2015.
Business. 1. Kansas Arbor Day Poster Contest. 2. Emerald Ash Borer Response Plan. 3. Trees for Eisenhower Elementary.
Comments. <i>Next meeting is scheduled for January 26, 2016.</i>
Adjournment.

**CITY OF ABILENE
TREE BOARD
MEETING MINUTES**

**September 22, 2015
at 5:30 p.m.
Abilene Public Library ~ Jordan Room
209 NW 4th St.**

Members Present: John Barbur (Vice-Chair), Jack Gilstrap, Johnny Kinder and Christina Krause (Chair)

Members Absent: Jacob Hawk

Staff Present: Jennie Hiatt, Administrative Assistant and Daniel Shea, Community Development Director

Item A. Call to Order – Welcome.

Kinder called the meeting to order.

Item B. Approval of Agenda.

Barbur made a motion to approve the agenda with the addition of the discussion of the Kansas Arbor Day Poster Contest. The motion was seconded by Krause. The motion passed unanimously. (4-0)

Item C. Approval of Minutes – April 24, 2015.

Krause made a motion to approve the minutes as written. The motion was seconded by Barbur. The motion passed unanimously. (4-0)

Item D. Business.

1. Election of Officers.

Kinder made a motion to elect Krause for Chair. The motion was seconded by Gilstrap. The motion passed unanimously. (4-0)

Kinder made a motion to elect Barbur for Vice-Chair. The motion was seconded by Krause. The motion passed unanimously. (4-0)

Krause took over as Chair of the meeting.

2. Emerald Ash Borer Discussion.

Barbur gave an overview of the Emerald Ash Borer situation.

There was discussion.

Gilstrap made a motion to move forward with putting together an Emerald Ash Borer response plan/policy. The motion was seconded by Kinder. The motion passed unanimously. (4-0)

3. Trees for Eisenhower Elementary Discussion.

There was discussion regarding possibly correlating the plantings with the Fourth Grade Forester Program in the spring, since this will be the first year for the fourth graders to be in their new building. If not then the plan will be to shoot for the fall if the spring doesn't work out. Barbur was going to check with his wife, who's on the USD 435 school board to see if there's already a landscaping plan in place or not.

4. Kansas Arbor Day Poster Contest.

There was discussion.

It was decided to invite the 5th Grade art teachers to the next meeting to go over the details of the Arbor Day Poster Contest with them.

Gilstrap made a motion to move the November 24th meeting to October 27th, due to the Thanksgiving holiday. The motion was seconded by Kinder. The motion passed unanimously. (4-0)

There was discussion.

Barbur made a motion to amend the proposed motion to have it pending whether or not the representatives from the school are able to attend at that time or not. The motion was seconded by Kinder. The motion passed unanimously. (4-0)

Krause will contact Garfield Elementary, Kinder will contact Abilene Bible Baptist Academy and Hiatt will contact St. Andrew's Elementary.

Item F. Comments.

There weren't any additional comments.

Item G. Adjournment.

The meeting was adjourned by consensus.

Minutes Submitted,

Minutes Approved,

Daniel J. Shea, MRCP
Community Development Director

Christina Krause, Chair or
John Barbur, Vice-Chair

Trees Are Terrific...In Kansas Cities and Towns!



The Kansas Arbor Day Poster Contest lesson plan supports Kansas College and Career Ready Standards for Speaking and Listening, Mathematics, and Science.

Hands-on activities teach students the multiple benefits of community trees, how to identify the economic, environmental and social benefits of them, calculate values of those benefits and how to identify and measure trees.

Poster contest information, rules, and School Winner Report Form on pages 25-27.

Local-winning posters must be submitted to your Kansas Forest Service District/Community Forester by February 5, 2016.

WELCOME



Dear Fifth Grade Educator,

All it takes is one hundred degree day in Kansas to appreciate the shade of a tree. Depending on the site and location in your city, the difference between shaded areas and those without shade could be anywhere from 14 degrees to 55 degrees. The hues of fall capture our attention before winter arrives and we seek the protection from cold and blustery winds. But trees do more for Kansans and our cities than beautify and increase our comfort. A 2012 study of the trees and forests in Douglas County show that their 14.1 million trees provide \$17.7 million in annual service by removing pollution and provide an annual benefit of \$2.9 million by reducing energy consumption. This makes a difference to you and me because these and other trees in Kansas directly affect our health and well-being. Research is being conducted throughout the nation that shows the direct link to trees being present and the reduction of health issues. Students will learn in this lesson plan that our community trees provide multiple and tangible benefits to Kansans and our state's cities and towns.

Community trees are working trees and as you delve into the lesson plan, you'll quickly see that these benefits are plentiful and provide considerable value. Their contribution to a community and the people who visit and reside there can add up to thousands or millions of dollars in economic, environmental and social benefits. These benefits are improved air and water quality, energy conservation, reduced power plant emissions, economic appeal, shorter hospital stays, and improved psychological well-being, to name just a few! Your classroom will also learn the basics of tree identification, proper tree placement and how to measure community champions.

The use of part or all of the activities in this lesson plan is encouraged, but not mandatory, for participation in the state poster contest. You may adapt, alter, or supplement these activities to meet the needs of your classroom.

Please follow the poster contest rules on page 26. Be sure that each poster is signed where stipulated and that the theme is correct. The poster should not be laminated, matted, mounted, framed, or folded. For those local-winning posters advanced to the district-level of competition, please attach a completed School Winner Report Form (page 27) to the back of your local-winning poster. Many cities in Kansas participate in the Tree City USA program and have tree boards and/or city staff supporting forestry programs locally. These folks may be good points of contact for a local contest. **All local-winning posters must be to the office of your District/Community Forester by February 5, 2016.**

I encourage you to join the Kansas Forest Service and our contest partners, below, in teaching the youth of Kansas about the abundant and valuable forestry resource in Kansas cities and towns!



Kim Bomberger

Kansas Arbor Day Poster Contest Coordinator and
NC/NE District Community Forester



Table of Contents

Welcome 2

Step 1

Discover What Trees Do For You and Your Community..... 4-6

Basic Activity: Identify the Benefits and Value of Trees..... 6-9

Extension Activity: Measure and Identify Community Trees.... 16-23

Step 2

Create a Poster 25

Contest Rules 26

School Winner Report Form 27

Submit to a KFS District/Community Forester 29

Step 3

Celebrate Arbor Day 28



Step 1

Discover What Trees Do For You and Your Community

BASIC ACTIVITY

Objectives:

Students will be able to:

- Identify the social, environmental and economic benefits of trees in cities and towns.
- Identify eight locations where planting a tree in their community would have a social, environmental and/or economic impact.

Time Recommended: Approx. 60 minutes of class time.

Materials Needed:

- Pencils/Pens
- Handout/overhead of *World With Trees* on page 12
- Handout of *Benefits of Trees* on pages 10-11
- Handout of *Benefits of Your Community Trees Worksheet* on pages 14-15
- Handout of *Community Neighborhood Worksheet* on page 13
- Handout of Rubric/Vocabulary on page 9

Kansas College and Career Ready Standard Supported:

Science: 5-ESS3-1.

Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Teacher Background Information:

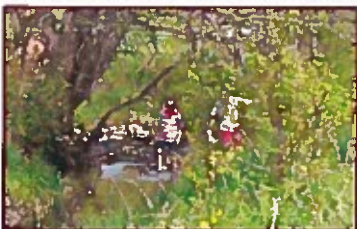
In the early 1900s America was still a very rural nation where people had close ties to nature. Today nearly 81 percent of the United States population lives in urban or suburban areas. Often Kansans think of forests as distant, vast tree-covered tracts of land, unaware of the urban and community forests that exist in our own state. There are actually a million acres of community forests that exist in Kansas. Trees in our communities play a crucial role in Kansans health and well-being.

Community trees are working trees. These trees not only provide beauty, shade our streets and schoolyards, create habitat and food for wildlife; they also improve air quality, muffle noise, moderate air temperatures, filter runoff into streams and rivers, and reduce energy consumption. Evidence continues to be produced that trees are essential to the quality of life and environmental health in our cities and towns.

Research shows that trees help reduce stress in the work place and speed recovery of hospital patients. Trees increase land values. Houses with trees often sell faster and for more money than those without trees. Commercial retail areas are more attractive to shoppers, apartments rent more quickly, tenants stay longer, and space in a wooded setting is more valuable to sell or rent.

Studies also show that young children benefit greatly from connecting with trees and nature. A connection with nature benefits children educationally, behaviorally, and developmentally. On-going research confirms that regular connection with the natural world helps:

- Build children's visual-spatial skills.
- Improve children's ability to concentrate, including children with Attention Deficit Disorder (ADD).
- Enhance children's motor skills, such as coordination, balance, and agility.



Cities and towns benefit greatly from their community trees. Based on data from a public tree inventory in **Fairway, Kansas**, that city's 3,079 street and park trees absorb nearly 1,900 pounds of air pollutants (particulate matter, nitrogen oxide, sulfur dioxide and ozone) per year. These trees also sequester more than 1.5 million pounds of carbon dioxide while conserving 670 megawatts of electricity and 90,731 therms of natural gas. Because trees in the city reduce the demand for heating and air conditioning, the demand from power plants is reduced and therefore, emissions released from power plants is reduced.



Runoff from urban areas is a major source of pollution entering wetlands, streams, lakes and oceans. Healthy and maturing trees can reduce the amount of runoff and pollutant loading going into these water systems. This becomes a critical function because federal law requires states and localities to control nonpoint-source pollution, such as from pavements, buildings and landscapes. The trees in Fairway intercept and store more than 6.8 million gallons of rainfall with their leaves and branches, thereby reducing runoff volumes and erosion of watercourses as well as delaying the onset of peak flows.

Most people recognize that trees help beautify their properties and communities. There are many esthetic benefits to a community such as human health and well-being, increased public safety, increased property values, attractiveness of business districts, social and psychological, noise reduction, wildlife habitat, reduced street maintenance, jobs and environmental education. All combined, these benefits plus those previously mentioned, are valued for Fairway at more than half a million dollars per year! Trees also store carbon in their wood and tissues. The trees in Fairway store more than 28 million pounds of carbon for a one-time benefit of \$210,000.

As more trees are planted in a community and those trees mature into a good condition, the benefits to the community increases tremendously. An inventory in Emporia, Kansas found 15,300 street trees providing more than \$900,000 in annual ecosystem services and storing more than 71.8 million pounds of carbon.



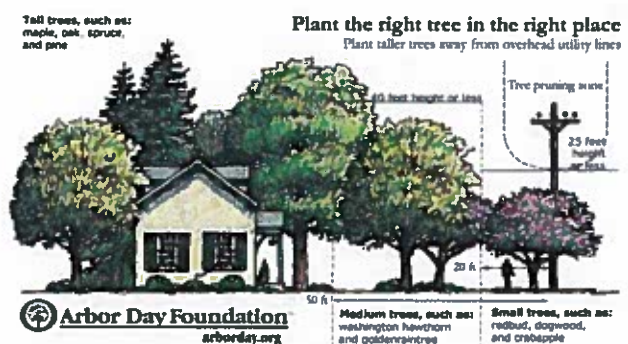
At left: Yard and street trees in Fairway.

Above: Yard, street and streamside trees in Emporia.

But trees within cities also have special challenges. There often is not much space for their roots to spread out and urban soils are often poor. Tall buildings can prevent trees from getting full amounts of sun.

Pollution from cars, trucks, buses and factories can affect the health of a tree and impact how well it grows. If the right tree is not planted in the right place, branches can grow and tangle in power lines creating a hazard tree. In spite of these challenges, many species of trees have adapted to the city environment and grow well, providing numerous benefits to the people that live there.

As mentioned above, planting a tree in the right location is very important for a tree to live life to its fullest potential. When people plant large-growing trees under or too near overhead utility lines this requires electrical providers to remove vegetation away from the lines to provide for public safety and reliable service. The graphic below illustrates the proper placement of trees where above-ground utilities exist.

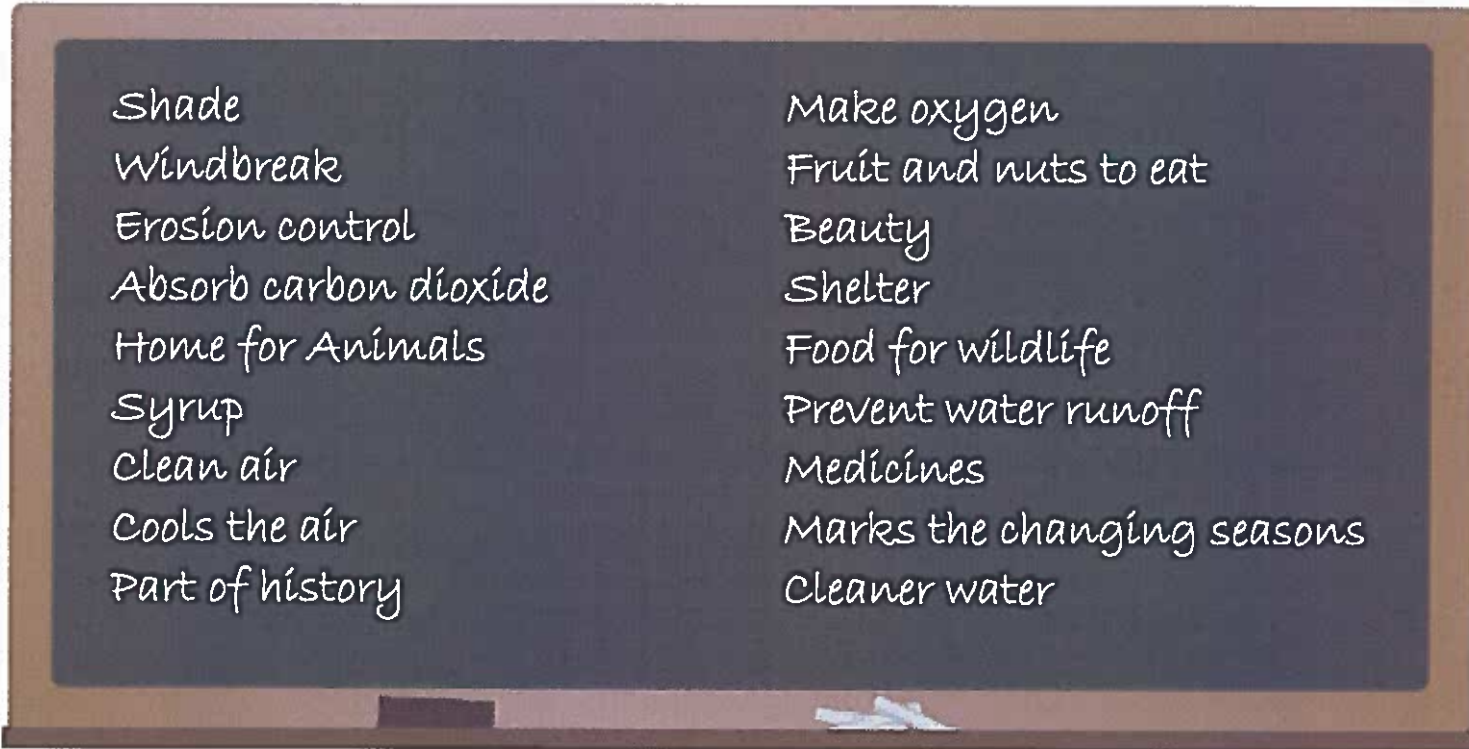


It takes time, effort, and funding to establish and maintain the urban forest, but recent studies of the community forest has shown that city trees provide benefits to the community worth 2 to 3 times the cost of their planting and care. For many years trees were only valued for the wood products that they could produce but thanks to research conducted throughout the United States, it is proven that trees are a critical green infrastructure to communities. In the following activity, students will have an opportunity to learn how trees impact their community environment and calculate a rough estimate of a “working” tree’s value. They will explore the environmental, economic and social benefits trees bring our cities and towns.

Getting Started: Assess Knowledge

Display or pass out handouts of the ***World with Trees Worksheet*** on page 12. Ask, “Which of these two worlds would you rather live in?” As students respond, ask *why they chose as they did*. Record responses on the board without comment.

Continue class discussion by asking, “Why are trees important to our community?” Building off of students’ prior knowledge and information gathered from the handout/displayed image, encourage students to generate a list of the products and contributions made by living trees. A possible list of responses is below.



Shade	Make oxygen
Windbreak	Fruit and nuts to eat
Erosion control	Beauty
Absorb carbon dioxide	Shelter
Home for Animals	Food for wildlife
Syrup	Prevent water runoff
Clean air	Medicines
Cools the air	Marks the changing seasons
Part of history	Cleaner water

Identify The Benefits and Value of Community Trees

Write the words TRUE and FALSE on the chalkboard. Tell students you are going to read some “Believe it or Not” statements about trees. They need to predict if each statement is true or false. If they believe the statement is false, they should remain seated. To start read ONLY the bolded statements #1-10 on pages 10 and 11 out loud.

Once you have gone through all 10 statements, tell students that all were true. Trees do all these amazing things for us and the environment we live in. Write “economic benefit,” “environmental benefit,” and “social benefit” on the board. Pass out the ***Benefits of Trees Handout*** (pages 10-11) and go through the statements again with students, this time incorporating the background information and comments following each statement.

Discussion:

As each benefit is discussed, ask students *if they think that particular tree benefit results in more of an:*

Environmental benefit – Does it help the ecosystem/environment in which people live?

Economic benefit – Does it provide an opportunity for people or the community to save money by lowered costs or increased value?

Social benefit – Does it improve the health or quality of life for people in some way?

After going through the handout, ask *if planting trees in certain locations can have multiple benefits?*

Tell students that even though research is proving the environmental, social, and economic benefits of trees, we're losing community trees every day. In some U.S. cities, for every four trees removed, only one is being planted back in the community. Kansas Tree City USA communities excelled by planting back a combined 64% of trees that were removed throughout the state in 2014.

Land conversion is also a threat to forests and open space in the United States and Kansas. The Kansas City metropolitan area is projected to grow by half a million people, consuming 400,000 acres of land by 2030. The eastern part of the state holds the majority of Kansas forestland and most threatened trees are not preserved.

Distribute the **Vocabulary/Rubrics** (page 9) as well as the **Community Neighborhood Worksheet** (page 13) and the **Benefits of Your Community Trees Worksheet** (pages 14-15) in preparation for the next instructional set.

Student Directions: Explain to students that many communities in Kansas have recognized the importance of trees in their city or town and have created a local tree board. Tree board members are a volunteer group that oversees the planting and care of publicly-owned trees or serves in an advisory capacity to a local city department that executes the actual work to be completed. If your community has a tree board, consider inviting a member into your classroom to talk about the work they do.

Tell students to imagine that they have volunteered to serve on their local tree board. After being formally appointed by their city's mayor to the tree board,

their first project is to create a planting plan to benefit neighborhoods near their school or homes. Split students up into small working groups of three. Each group should draw in (plant) 8 trees in locations on the **Community Neighborhood Worksheet** where they feel the trees might be of the most value to themselves, their community or both. Ask each group to number each tree that they plant, #1-8. On the **Benefits of Your Community Trees Worksheets**, they should then list where they planted each of their trees, and what environmental, economic, or social benefit each tree might provide in the location they selected. Remind them to make sure the number of the tree on the **Community Neighborhood Worksheet** corresponds to the number of the tree location described on the **Benefits of Your Community Trees Worksheets**.

Mention to students that it is always important to plant the right kind of tree in the right location, as already discussed, but for this activity they should imagine that they have already selected the appropriate tree species for each location they might select.

Give students the following example:

If they planted Tree #1 by the stream it might have:

- 1) An environmental benefit of holding the soil in place;
- 2) An economic benefit of saving the city money by reducing storm runoff;
- 3) And a social benefit of adding beauty to the area

Then point out the "Tree A" example on the worksheets.

Explain to students that they should list what benefit (social, economic or environmental) was the main reason for selecting the tree location that they did. When they do their tree location totals at the end of the **Benefits of Your Community Trees Worksheet** (pages 14-15) they may have 3 trees in one location and no trees in another – that is fine. Encourage students to refer to the **Benefits of Trees Handout** or the list on the board for a reminder of some of the different benefits trees provide in different locations.

Allow the tree boards about 20 minutes to complete their worksheets. When the groups are done with their worksheets, post them on the board so the groups can compare tree planting locations. Ask them to imagine each of their neighborhoods joined together, making up a large city. As time permits, allow the tree boards to share their community tree planting decisions and predict the social, environmental and economic impact of the trees they planted.

Refer students back to Benefit #10 on their **Benefits of Trees Handout** that says, "Nationally, the 60-plus million street trees have an average value of \$525 per tree each year." Tell students to multiply the number of trees they planted by \$525 ($8 \times \$525 = \$4,200$). That will give them a rough idea of the economic value from the environmental benefits provided by the trees they planted in their community. Then on the board, calculate the total value of the trees planted by the whole class (# of tree boards $\times$ \$4,200) to demonstrate the impact a group of people planting and caring for trees in a community can have on the economy of a community.

Tell students that if they planted 3 trees around the little house they could give themselves \$10,000 for the increased value of their property. If the 3 trees planted around the little house were on the west and south side of the house they could give themselves an extra \$50 in energy savings.

Stress to students that although part of this activity was to estimate the economic value of the trees they planted, the object is not to see who totaled up the greatest amount of money. The objective here is to help students recognize that trees provide benefits to our lives in many ways. Some values are easily measured in terms of dollars and cents while others, like the beauty of trees in a park, are subjective from one person to another and are more difficult to measure.

Deforestation associated with anticipated national growth of 120 million people is predicted to exceed 50 million acres. Surveys indicate that about 66-100 million spaces exist along our city streets where trees could be planted. This translates to the potential to absorb 33 million more tons of carbon dioxide every year and at the same time save consumers \$4 billion in energy costs.

Be sure to explain that in a city, trees face numerous challenges like tight spaces, poor soils and pollution. It's always important to select the right tree for the right space, but in communities that is especially true if a tree is to grow and thrive.

SUPPLEMENTAL ACTIVITY: GET OUTSIDE!

If the weather permits, take students on a walk around the neighborhood and look at community trees. Predict what benefit each tree might provide where it is growing. Encourage students to imagine planting a tree in a vacant location along your route. You could print a map of your route or the area of the city where you will walk ahead of time and have students mark each vacant location on the map as a future planting spot. Take the process a step further and have students specify if the tree should be tall-growing (more than 40 feet in height), medium-growing (less than 40 feet but more than 25 feet in height) or small-growing (less than 25 feet in height). If the vacant locations are in the area between the sidewalk and the street curb (often called the right-of-way or city easement) discuss that trees, depending on their mature sizes, can produce large root systems and trunks that can interfere with and damage the sidewalk or curb if the tree is planted too close to either. General guidelines for proper placement in the right-of-way (ROW) are: small tree (4 to 6 feet width of the ROW), medium tree (6 to 8 feet width of the ROW), and large trees (more than 8 feet in the ROW).



The City of Effingham has many right-of-ways that are more than 10 feet wide, making the planting of large-growing trees a desirable and appropriate choice for these street locations.

You may also have students write a story where a tree is the main character. The tree could be one that they saw on their walk or on the school grounds. The story can talk about the tree's life and discuss what benefits that tree might provide to them and to their community in the future. The class may wish to name their tree - Suzy Sycamore, Burt Bur Oak, or Ginger Ginkgo, for example - take pictures of it several times during the year and write stories about it on Facebook, Twitter, or a school webpage. To learn about one tree's life, her friends and the world around her, follow Heartland Tree Alliance's Penny Oak on Twitter at <https://twitter.com/pennyoak>.

Vocabulary Words

Broadleaf – trees that bear fruit and flowers; with leaves that are flat, thin, and usually shed annually.

Buffer Strip – rows of trees or grasses planted along a stream or waterway to help prevent soil erosion and filter pollutants from running into the waterway.

Carbon dioxide – a gas exhaled by animals and released from burning fossil fuels or in the process of decomposition.

Community forest - trees found along city streets and roads, in parks and other publicly-owned locations and trees growing on private property within cities.

Conifer – trees that bear cones and have needle-like or scale-like leaves. Most lose their leaves gradually and are evergreens.

Deciduous – trees that lose their leaves in the fall.

Evergreen – trees with leaves that remain alive and on the tree through the winter into the next growing season.

Fossil fuels – non-renewable fuels, like coal, oil and natural gas, used to create energy. Once the supply of a fossil fuel has been depleted it cannot be used again.

Greenhouse gases – gases, like carbon dioxide, that trap heat in the atmosphere.

Heat island effect – a term used when city temperatures run higher than those in nearly suburban and rural areas, primarily due to large areas of unshaded buildings and pavement.

Nonpoint source pollution – generally a result from land runoff, precipitation, atmospheric deposition, drainage, seepage or hydrologic modification.

Peak flow – a concern of stormwater discharge from cities; when water flow is high, pollutants from land runoff wash off into receiving waterways and erosion from high water discharge can damage stream banks and channels and send sedimentation downstream.

Public trees – trees that grow on city or other publicly-owned property. These trees may be adjacent to city streets, in parks and cemeteries, around county courthouses or on school properties.

Runoff – the flow of water, from rain, snowmelt, or other sources that can carry soil or ground chemicals with it.

Street trees – trees near the street, often located between the sidewalk and street, which are usually managed by the city or town.

Tree Board – a volunteer group that oversees the planting and care of publicly-owned trees.

Tree City USA program – a national program that encourages the management of the community forest by cities and towns.

Water Management Systems – Underground systems that direct waste water and rain water through a system of sewers and drains.

Assessment Rubric: (To be used with the Benefits of Your Community Trees Worksheets)

Pass out the rubric or put on the board at the start of the activity so students clearly understand the measured objectives.

1-2 Points SEED LEVEL	3-5 Points SEEDLING LEVEL	6-8 Points SAPLING LEVEL	9-10 Points TREE LEVEL
✓ Three trees are drawn into the Community Neighborhood Worksheet. ✓ A few planting locations were identified. ✓ At least one benefit social, environmental, or economic is correctly identified for each tree drawn in.	✓ More than half of the trees are drawn into the Community Neighborhood Worksheet. ✓ Over half the planting locations are identified. ✓ At least two benefits social, environmental, or economic are correctly identified for each tree drawn in.	✓ All 8 trees are drawn neatly into the Community Neighborhood Worksheet. ✓ Clear descriptions of the selected planting locations are shown. ✓ At least one social, environmental, and economic benefit is correctly identified for each tree drawn in. ✓ The tree totals are filled in on the Benefits of Your Community Trees Worksheet.	✓ All 8 trees are drawn neatly into the Community Neighborhood Worksheet. ✓ Clear descriptions of the selected planting locations are shown. ✓ Several social, environmental, and economic benefits are correctly identified for each tree drawn in. ✓ The tree totals are filled in on the Benefits of Your Community Trees Worksheet.

Benefits of Trees Handout

Trees provide benefits to you and to your community in a variety of ways. As you read through these examples, consider if that tree benefit is more of an environmental, economic or social benefit.

1. **Trees properly planted around a home can lower air conditioning and heating costs. TRUE.** Shade trees



planted on the west and south sides of a home help shade and cool the air around the home during the summer reducing cost of air condition up to 30%. Evergreen trees placed on the north and west sides of a home or building block cold winter winds, reducing cost of heating by 20-30%. For example, if you have two identical houses with the only difference being that one has strategically planted trees and the other does not, the house with the trees might only spend \$70.00 a month for heating while the treeless home might have a \$100.000 heating expense. That saving also means less burning of fossil fuels (non-renewable oil, coal, or gas), which is good for the environment!

2. **Trees help clean the air. TRUE.** Trees improve the quality of the air we breathe by capturing dust and pollution particles from dirty city air that can affect our health. These particles cling to the leaves rather than float in the air. When it rains, the dust and particles are simply washed to the ground. Trees also remove greenhouse gases, like carbon dioxide, from the air and replace it with oxygen for us to breathe.

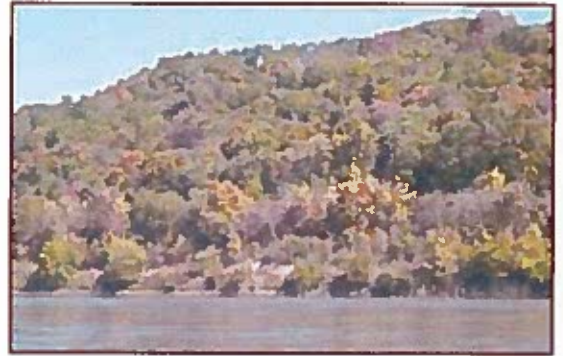
3. **Healthy, mature trees around a house make the property more valuable. TRUE.** Trees can add an average of 10-15% to a property's value. For example, a home or apartment valued at \$100,000 might sell for \$110,000 (an increase of \$10,000!) if it has trees around it. Tree planting is one of the best investments a person can make in their home. And in business areas, too. Business districts with trees are more attractive to shoppers. Surveys have found that shoppers are willing to pay 9-12% more for goods and services in business districts with large, well-cared for trees. Visitors claim they will pay more for parking on streets with trees.



4. **Research studies suggest that housing areas with trees and other green plants have less violence and crime. TRUE.** Living in an area with trees helps reduce stresses that can be associated with living in a big city. Less stress can ease tensions that sometimes lead to violence. Even a small number of trees and other green plants in an area are associated with lower crime rates. Apartment buildings that had lots of trees and plants had 52% fewer crimes than apartment buildings with few or no trees or plants.
5. **Hospital patients have been shown to recover from surgery more quickly and require less pain medication when their room had a window that provided a view of trees. TRUE.** A study found that exposure to trees and nature lowered signs of stress, like heart rate, blood pressure, and muscle tension. Many Kansas hospitals and recovery centers have developed horticulture therapy programs for their healing patients. Hospitals often contain a walk-through garden, trees near the building, and small plants inside hospital rooms in efforts to assist a patient's recovery.

Benefits of Trees Handout

6. **Trees help slow the force of rain water, which helps control storm runoff. This results in improved water quality, protected soil, and money savings. TRUE.** The canopy (leafy top) of a tree softens and slows the force of raindrops. This gives water more time to absorb into the ground rather than eroding the soil and running off into storm sewers. Large water management systems are expensive. When trees are planted, smaller drainage systems can be used, saving money for a community and improving the environment.
7. **Trees help prevent soil erosion, flooding, and landslides. TRUE.** Tree roots hold soil in place and increase the ability of water to soak into the soil. Trees planted as buffer strips along streams help prevent flooding and help filter out chemicals that might wash into the stream.
8. **The overall cooling effect of a healthy, mature tree is equivalent to 10 room-sized air conditioners operating 20 hours a day. TRUE.** Water from a tree's leaves evaporates in the hot weather. The evaporated moisture cools the air around the tree. Since cool air is heavier than hot air, this cool air moves toward the ground making us feel cooler. Cities, with stretches of concrete streets, sidewalks, and parking lots, are sometimes referred to as "heat islands" that are 5-9 degrees hotter than surrounding areas. Planting trees in cities helps alleviate the heat island effect – which saves both energy and money!
9. **Getting outside and connecting with trees and nature has been shown to improve children's concentration and attention span. TRUE.** When children spend time in nature-rich spaces their ability to concentrate improves. Even small areas of green space, with a few trees and plants, can make a difference for children.
10. **The city of New York determined that for every dollar spent on trees the city receives \$5.60 back in benefits the trees provide. TRUE.** Think of all the thing a trees does for the environment. If a city had to find other ways to handle storm water, clean the air, remove carbon dioxide generated by industry, reduce energy costs and beautify the community it would be very costly. All the things a tree does naturally are of great benefit to a city or town. It has been estimated that the nation's 60 million street trees have an average value of \$525 per tree each year.



Trees Work for You in Cities and Towns! Trees throughout Kansas provide valuable health and energy benefits each year. Here's what publicly-owned trees contribute in several cities:

Seneca	Marysville	Westwood	Emporia	Fairway	Burlingame	Mission Hills
1,944 trees	3,711 trees	1,915 trees	15,300 trees	3,079 trees	984 trees	3,932 trees
\$325,990	\$628,716	\$274,410	\$941,523	\$506,126	\$41,595	\$1,230,242

A World With Trees Worksheet

A World Without Trees



Silty, flood-prone rivers

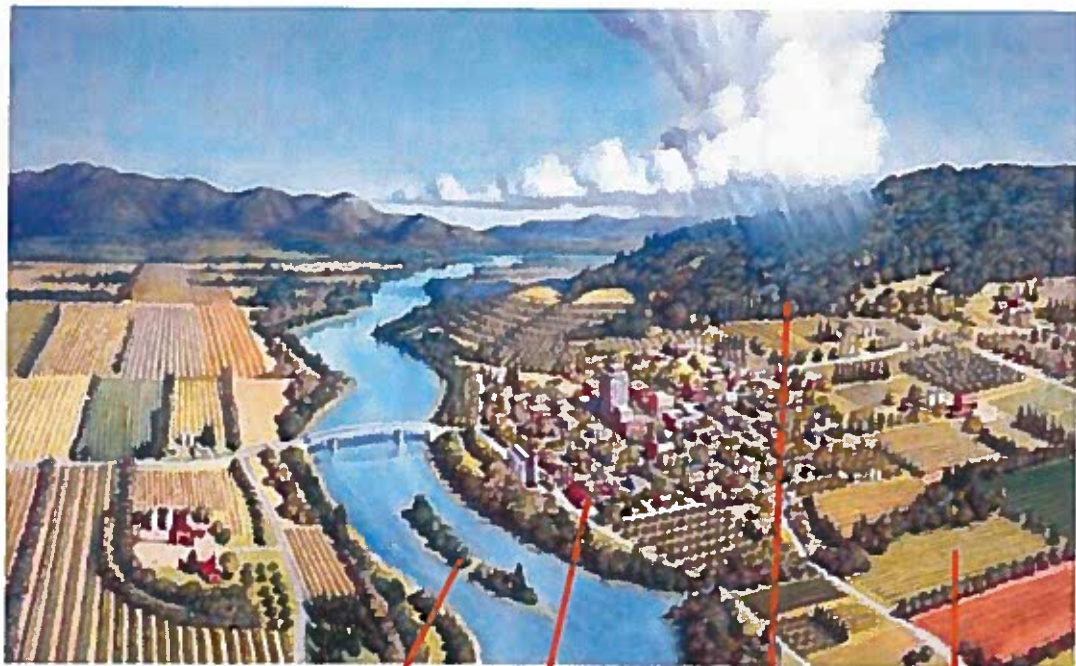
Hot, sun-baked cities

Rapid runoff from slopes

Eroded farmland

Both images courtesy of the Arbor Day Foundation

A World With Trees



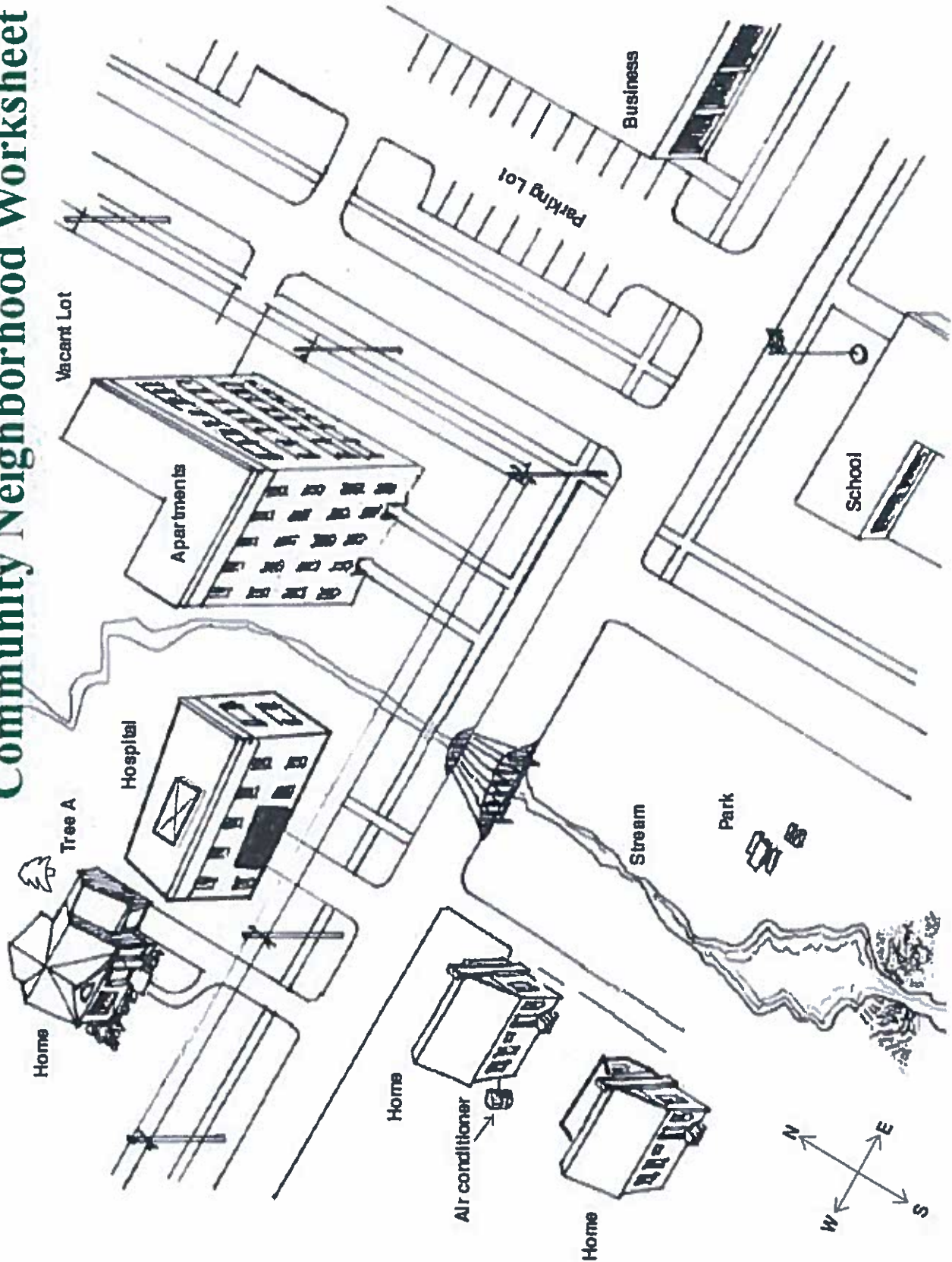
Natural River Systems

Shaded homes and streets

Forested slopes for recreation

Productive Farmland

Community Neighborhood Worksheet



Benefits of Your Community Trees Worksheet

Directions: Your tree board has been given 8 trees to plant in your community. On the *Community Neighborhood Worksheet* you should plant (draw in) 8 trees in areas where you feel they will provide the most benefit, either to you, to the community or both. Number each tree that you plant. Then on this worksheet, list where you planted each of your trees and what environmental, economic, or social benefit each tree might provide in the location you selected. You may refer to the *Benefits of Trees Handout* for ideas.

Environmental benefit: Does the tree benefit the ecosystem/environment in which people live?

Economic benefit: Does the tree help people or your town, save money by lowering expenses or increasing property value?

Social benefit: Does the tree improve the health or quality of life for individuals in some way?

EXAMPLE

Tree A:

Planting Location On the North side of the City Library

Why did you select this location for this tree? The tree will help protect the library from cold winter winds.



What environmental, economic or social benefits might you get from this tree? Saving money for heating would be an economic benefit. Using less energy for heating would be a benefit for the environment.

Which benefit was most important to you when planting this particular tree? Economic.

NAME _____

Tree 1: Planting Location _____

Why did you select this location for this tree? _____



What environmental, economic or social benefits might you get from this tree? _____

Which benefit was most important to you when planting this particular tree? _____

Tree 2: Planting Location _____

Why did you select this location for this tree? _____



What environmental, economic or social benefits might you get from this tree? _____

Which benefit was most important to you when planting this particular tree? _____

Tree 3: Planting Location _____

Why did you select this location for this tree? _____



What environmental, economic or social benefits might you get from this tree? _____

Which benefit was most important to you when planting this particular tree? _____

Benefits of Your Community Trees Worksheet

Tree 4: Planting Location _____



Why did you select this location for this tree? _____

What environmental, economic or social benefits might you get from this tree? _____

Which benefit was most important to you when planting this particular tree? _____

Tree 5: Planting Location _____



Why did you select this location for this tree? _____

What environmental, economic or social benefits might you get from this tree? _____

Which benefit was most important to you when planting this particular tree? _____

Tree 6: Planting Location _____



Why did you select this location for this tree? _____

What environmental, economic or social benefits might you get from this tree? _____

Which benefit was most important to you when planting this particular tree? _____

Tree 7: Planting Location _____



Why did you select this location for this tree? _____

What environmental, economic or social benefits might you get from this tree? _____

Which benefit was most important to you when planting this particular tree? _____

Tree 8: Planting Location _____



Why did you select this location for this tree? _____

What environmental, economic or social benefits might you get from this tree? _____

Which benefit was most important to you when planting this particular tree? _____

Totals: How many trees did you plant in these locations?

#_____ by the stream, #_____ by the school, #_____ in the park, #_____ by a home, #_____ next to the hospital,

#_____ shading a parking lot, #_____ by the apartments, #_____ by the business district, #_____ in the vacant lot

Which benefit (environmental, economic, or social) did you consider most often when selecting locations for planting these trees? _____

Step 1

EXTENSION ACTIVITY

Objectives:

Students will be able to:

- Accurately describe and identify the characteristics that distinguish a conifer and a broadleaf tree
- Measure and record the height, circumference and crown spread of a selected tree

Time Recommended: 60 to 90 minutes

Materials Needed:

Measuring tapes Yardsticks/rulers
Pencils and paper Clipboards

Kansas College and Career Ready Standards Supported:

Mathematics:

5NF 2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result $\frac{2}{5} + \frac{1}{2} = \frac{3}{7}$, by observing that $\frac{3}{7} < \frac{1}{2}$

5MD 1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Teacher Background Information: Holding a community tree contest is a great way to get children interested in the trees in their city or town. Students will learn some of the techniques used to measure champion trees and how to identify trees.

The Kansas Champion Tree Program accepts nominations of large trees throughout the state. The majority of trees listed as champions are native to the state, though a few non-native species are also included. The Kansas program follows a point system established by the American Forests National Register of Big Trees. One point is awarded for each inch of circumference, one point per foot of height and one-fourth point per foot of average crown spread.

Total Points = Circumference + Height + Crown Spread

To view current Kansas champion trees, visit the Kansas Forest Service website at

<http://www.kansasforests.org/about/championtrees.shtml>

Getting Started: Tell students that they are going to take part in a champion tree contest to find the biggest trees in your town or in your area of the community. Ask students to think about the trees they see on their way to school. Where do they see the biggest trees – in yards, in parks, or around the school? Then ask them how many different kinds of trees they see.

Help students understand that not all tree species grow to be the same height. Some trees, like the Redwoods in California, are giants towering more than 250 feet above the forest floor while an eastern redbud may only reach a height of 25 feet. Both could be considered champions if they were the largest of their kind in the contest boundaries.



At left: Kansas champion white fir near Bonner Springs. Above: Kansas champion bur oak in St. George.

Tree Identification: Explain to students that trees are divided into two main groups - broadleaf trees and conifers.

Broadleaf trees have thin and flat leaves that usually shed annually. Broadleaf trees bear a variety of fruit and flowers. Ash, maple, oak, birch, sycamore, hackberry, elm and redbud are just a few of the many different kinds of broadleaf trees. Broadleaf trees are sometimes referred to as deciduous trees. In warm climates, some broadleaf trees, like magnolias, do not shed their leaves at the same time so they appear to remain evergreen.



Broadleaf

Conifers are cone-bearing trees. Most are evergreen. Conifers have needle-shaped or scale-like leaves. Most conifers are evergreen since they do not lose all their leaves at once. Pine, fir, juniper, and spruce are conifers.



Conifer

Images courtesy
Arbor Day Foundation

For visual learners, it is helpful to have a leaf sample from a conifer with needle-like leaves, a conifer with scale-like leaves and several samples of broadleaf trees. Leaves can be collected during the growing season, pressed in a plant press or in a phone book, and protected in inexpensive acrylic picture frames or run through a laminating machine before the leaf sample becomes brittle.

Cut tree pictures from old calendars or magazines and have the students group them as conifer or broadleaf. Take a walk around the school grounds and have the students distinguish between conifer and broadleaf trees, then have the students calculate the ratio of conifers to broadleaf trees in the area visited. If your classroom uses an i-Pad, the application called *Leaf Snap* may be a useful tool. It may be found at <http://leafsnap.com>.

Activity:

Ask students to think again about trees that they pass on their way to school.

- Are there more conifer or broadleaf trees?
- Can any generalizations be made about where broadleaf and conifers are planted? (Often conifers are planted in parks, large green spaces or for wind protection).
- Where might you go to look for the biggest broadleaf trees? Where might you find the biggest conifers in your community?

From the comments generated by the students, determine some of the best areas in the community in which to find large, mature trees.

Determine how large an area of the community is feasible to include in the contest. Is transportation available to your class or do you need to stay within walking distance of the school? Are there many sites in the community with large trees or just a few? Designate an area and set the boundaries.

Your class may choose to simply search for the biggest tree in the designated area. They may wish to find the biggest broadleaf and the biggest conifer. Students might learn to identify a particular tree species, perhaps their state tree, and hunt for this kind in the community. In all cases, students should be able to make the distinction between conifer and broadleaf trees and understand how to properly measure a tree. If a digital camera is available, have students take a picture of selected trees.

To further develop student identification skills the Arbor Day Foundation offers the guide *What Tree Is That?* in print or online at <http://www.arborday.org/trees/whatTree>. The guide is written as a dichotomous key, which requires users to answer “yes” or “no” through the steps of identification. It encourages observation skills and critical thought. More tree identification websites may be found at:

- *Virginia Tech Dendrology Factsheets:* <http://www.dendro.cnre.vt.edu/dendrology/factsheets.cfm>
- *Iowa State Extension:* http://www.extension.iastate.edu/forestry/iowa_trees/tree_id.html
- *Oregon State University Horticulture Department:* <http://oregonstate.edu/dept/ldplants/3plants.htm#pigl-cul>

Measuring Trees

Remind students that they are going to follow the point system used by the Kansas Champion Tree Program and the American Forests National Register of Big Trees. But first, explain that they are going to practice measuring trees before looking for their local champions. Divide students into groups of three or four. Each group will need a measuring tape, yardstick or ruler, pencil, paper and a clipboard to record their findings. Print the **Student Field Instructions** (pgs. 20-21) and the **Community Champion Data Collection Worksheet** (pg. 22) for each team.

It may be helpful to assign roles to each student within a group. Group jobs include:

Recorder – Records measurements and tallies points on the **Community Champion Data Collection Sheet**.

Investigator – Takes the measurements.

Manager – Assists the investigator to make sure measurements are accurate and is responsible for the measuring tape and yardstick/ruler.

Take students to a nearby area with enough trees to allow each team to measure a tree. Explain that they are measuring these trees for practice and later they will search for their “Community Champions”. If classroom time allows, you may also want to brainstorm for a unique name for your local contest. Examples of contest titles could be *Marysville’s Marvelous Trees*, *Wichita’s Wonders* or *The Pride of Prairie Village*.

Measuring Height

Step 1: Students should stand on level ground to take the measurements. If it is not possible to measure on level ground, measurements are to be taken from the uphill side of the tree.

Step 2: The student investigator extends his/her arm out straight so that the top of his/her fist is at eye level. Carefully using the yardstick, the manger makes sure that the top of the investigator’s fist is at eye level and then measures the distance from the investigator’s fist to the investigator’s eye. The recorder writes down this measurement.

Step 3: The investigator directly faces the tree to be measured holding the yardstick vertically in his/her extended fist so that the distance from the top of his/her fist to the top of the yardstick is the same eye-to-fist distance measured in the previous step. The manager checks the measurement then makes sure the investigator’s arm is straight out, first at eye level with the yardstick straight up and down.

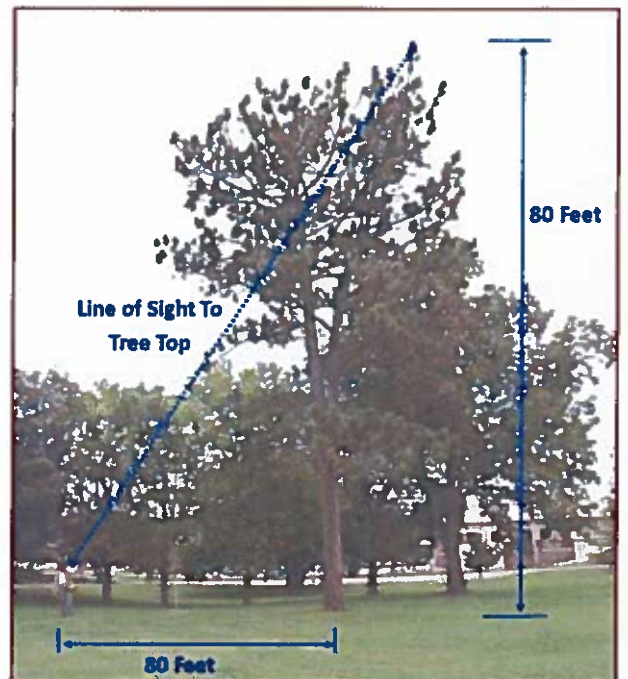


Example: If the distance from your eye to your fist is 25" make sure the distance from the top of your fist to the top of the ruler or yardstick is also 25". Be sure to hold your fist directly out at eye level and keep the ruler/yardstick straight up and down.

Step 4: The investigator slowly (and carefully) walks backward away from the tree until he/she can see the base of the tree by looking over the top of the fist and the top of the tree by looking over the top of the yardstick.

Step 5: The manager measures the distance, in feet, from the investigator to the tree. This distance is the height of the tree.

Step 6: The recorder writes down the height measurement and gives the tree one point for every foot of height.



Measuring Crown Spread

The crown spread of a tree is the distance its branches spread away from its trunk. The crown spread is calculated by measuring the distance of the widest spread and the distance of the narrowest spread. These two figures are then added together and divided by two to get an average.

The tree receives one-fourth ($1/4$ or .25) of a point for every foot of the average crown spread. Follow these steps to measure crown spread. If the tree should be a conifer with branches low to the ground, stand next to, not under, the branch tip.

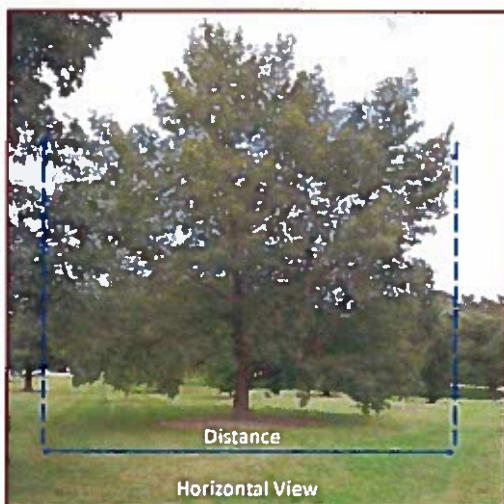
Step 1: The investigator finds the branch that sticks out the farthest from the trunk and stands directly under or just next to its tip.

Step 2: The recorder goes to the opposite side of the tree and stands under or just next to the tip of the branch extending farthest out on that side.

Step 3: The manager measures the distance in feet between the investigator and the recorder. The recorder writes down this number. This distance is the widest point of the crown spread.

Step 4: Next the investigator finds the branch nearest the trunk of the tree and stands directly under or just next to its tip.

Step 5: The recorder goes to the opposite side of the tree and stands under or just next to the tip of the branch closest to the trunk on that side.



Edge of Crown



Vertical View

Step 6: The manager measures the distance in feet between the investigator and the recorder. The recorder writes down this number. This distance is the narrowest point of the crown spread.

Step 7: The recorder adds the two distances together and divides by two to get an average crown spread. The recorder then awards the tree $1/4$ of a point for every foot of average crown spread or the students may divide the average crown spread by 4.

Circumference

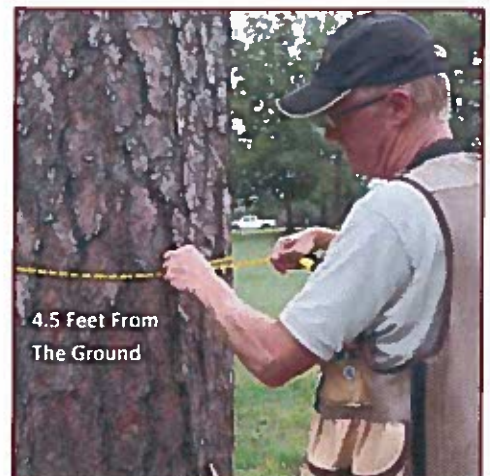
The circumference of a tree is the distance around its trunk. The circumference is measured 4 $1/2$ feet from the ground. Foresters use the term *Diameter at Breast Height* (D.B.H.) to identify this practice of measurement. If the tree forks or if there are branches at the 4 $1/2$ foot mark, the circumference is measured at the narrowest point below the 4 $1/2$ foot level. A record should be made that circumference was measured at a height different than 4 $1/2$ feet. Follow these steps to measure circumference:

Step 1: The investigator holds one end of the tape against the tree trunk at a measured point 4 $1/2$ above the ground.

Step 2: The manager wraps the tape around the trunk until it reaches the starting point.

Step 3: The investigator reads off the measurement in inches. If the tape measure does not provide a mark for the total inches, then each foot of circumference should be converted to inches by multiplying the number of feet times 12. This total number of inches is the circumference of the tree.

Step 4: The recorder writes down the circumference and gives the tree one point for every inch of distance around the trunk.



Field Instructions for Students

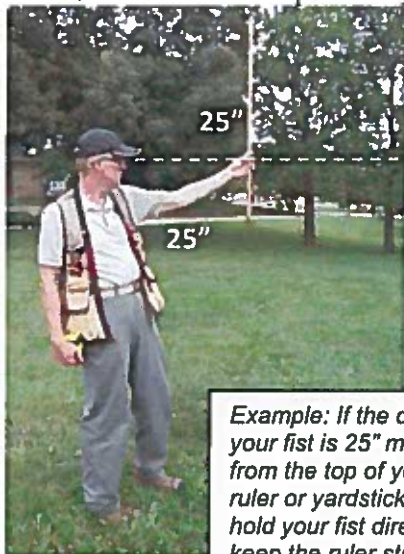
Follow the directions below to collect height, circumference and average crown width for each tree measured. Record information on the Community Champion Data Collection Worksheet.

Measuring Height

Step 1: Students should stand on level ground to take the measurements. If it is not possible to measure on level ground, measurements are to be taken from the uphill side of the tree.

Step 2: The student investigator extends his/her arm out straight so that the top of his/her fist is at eye level. Carefully using the yardstick or ruler, the manager makes sure that the top of the investigator's fist is at eye level and then measures the distance from the investigator's fist to the investigator's eye. The recorder writes down this measurement.

Step 3: The investigator directly faces the tree to be measured holding the yardstick or ruler vertically in his/her extended fist so that the distance from the top of his/her fist to the top of the yardstick or ruler is the



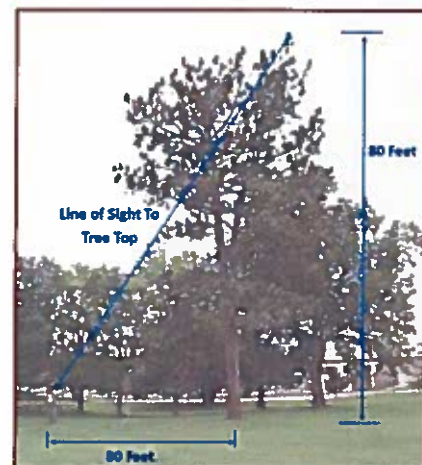
same eye-to-fist distance measured in the previous step. The manager checks the measurement then makes sure the investigator's arm is straight out, first at eye level with the yardstick straight up and down.

Example: If the distance from your eye to your fist is 25" make sure the distance from the top of your fist to the top of the ruler or yardstick is also 25". Be sure to hold your fist directly out at eye level and keep the ruler straight up and down.

Step 4: The investigator slowly (and carefully) walks backward away from the tree until he/she can see the base of the tree by looking over the top of the fist and the top of the tree by looking over the top of the yardstick.

Step 5: The manager measures the distance, in feet, from the investigator to the tree. This distance is the height of the tree.

Step 6: The recorder writes down the height measurement and gives the tree one point for every foot of height.



Circumference

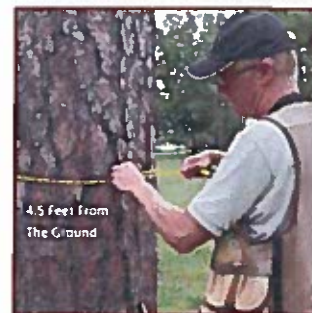
The circumference of a tree is the distance around its trunk. The circumference is measured 4 ½ feet from the ground. Foresters use the term *Diameter at Breast Height* (D.B.H.) to identify this practice of measurement. If the tree forks or if there are branches at the 4 ½ foot mark, the circumference is measured at the narrowest point below the 4 ½ foot level. A record should be made that circumference was measured at a height different than 4 ½ feet. Follow these steps to measure circumference:

Step 1: The investigator holds one end of the tape against the tree trunk at a measured point 4 ½ above the ground.

Step 2: The manager wraps the tape around the trunk until it reaches the starting point.

Step 3: The investigator reads off the measurement in inches. If the tape measure does not provide a mark for the total inches, then each foot of circumference should be converted to inches by multiplying the number of feet times 12. This total number of inches is the circumference of the tree.

Step 4: The recorder writes down the circumference and gives the tree one point for every inch of distance around the trunk.



Measuring Crown Spread

The crown spread of a tree is the distance its branches spread away from its trunk. The crown spread is calculated by measuring the distance of the widest spread and the distance of the narrowest spread. These two figures are then added together and divided by two to get an average.

The tree receives one-fourth ($1/4$ or .25) of a point for every foot of the average crown spread. Follow these steps to measure crown spread. If the tree should be a conifer with branches low to the ground, stand next to, not under, the branch tip.

Step 1: The investigator finds the branch that sticks out the farthest from the trunk and stands directly under or just next to its tip.

Step 2: The recorder goes to the opposite side of the tree and stands under or just next to the tip of the branch extending farthest out on that side.

Step 3: The manager measures the distance in feet between the investigator and the recorder. The recorder writes down this number. This distance is the widest point of the crown spread.

Step 4: Next the investigator finds the branch nearest the trunk of the tree and stands directly under or just next to its tip.

Step 5: The recorder goes to the opposite side of the tree and stands under or just next to the tip of the branch closest to the trunk on that side.



Edge of Crown



Vertical View

Step 6: The manager measures the distance in feet between the investigator and the recorder. The recorder writes down this number. This distance is the narrowest point of the crown spread.

Step 7: The recorder adds the two distances together and divides by two to get an average crown spread. The recorder then awards the tree $1/4$ of a point for every foot of average crown spread or the students may divide the average crown spread by 4.



Above: Kansas and national champion western soapberry in Olathe.



Above: Kansas and national champion white mulberry near Baldwin City.

Community Champion Data Collection Worksheet

Species

Common Name: _____ Date Measured: _____

Scientific Name: _____ Measured by: _____

Measurements

Points

Circumference @ 4 ½ feet: _____ inches x 1 = _____

Total Height: _____ feet x 1 = _____

Average Crown Spread: _____ feet ÷ 4 = _____

TOTAL: _____

Location of tree: _____

House Number or Property Name

Street Name

Owner of tree: _____

City-owned or Private Property?

Species

Common Name: _____ Date Measured: _____

Scientific Name: _____ Measured by: _____

Measurements

Points

Circumference @ 4 ½ feet: _____ inches x 1 = _____

Total Height: _____ feet x 1 = _____

Average Crown Spread: _____ feet ÷ 4 = _____

TOTAL: _____

Location of tree: _____

House Number or Property Name

Street Name

Owner of tree: _____

City-owned or Private Property?

Let's Take It Another Step!

With the information that students have collected by measuring large trees in their community, they also have data that can be inputted into an online program called the National Tree Benefit Calculator (found at <http://www.treebenefits.com/calculator>). When students enter a zip code, then the species, size and location of their tree, they will learn the annual environmental and economic value of the trees. Below is an example that calculates the values of a common community tree, the sugar maple, in Manhattan, Kansas.

Instruction:
Species: If you're looking for a Willow Oak it's listed as "Oak, Willow". If your tree isn't listed, use the general "Other" listings.
Diameter: How wide is your tree at about 4.5 feet from the ground?

Enter your tree info
Enter your tree's species

Enter your tree's diameter (between 0 and 45 inches)

What land-use type is this tree nearest?

National Tree Benefit Calculator

Beta

Trees in urban areas provide a number of important benefits. They help to clean the air, curb stormwater runoff, raise property values, sequester carbon, and reduce energy costs.

You have chosen:
Zip Code: 66502
City: MANHATTAN, KS, US
Climate Zone: Midwest
[change](#)

Enter information about a street-side tree and learn about the benefits it provides. Street-side trees are typically located in front yards, medians, parkways, planting strips or other common planting areas adjacent to streets

Annual Values of Other 25" Community Trees

American elm	\$266/year
American linden	\$228/year
Bur oak	\$250/year
Eastern redcedar	\$76/year
Ginkgo	\$128/year
Ponderosa pine	\$193/year
Red oak	\$168/year
Swamp white oak	\$215/year
Sycamore	\$250/year

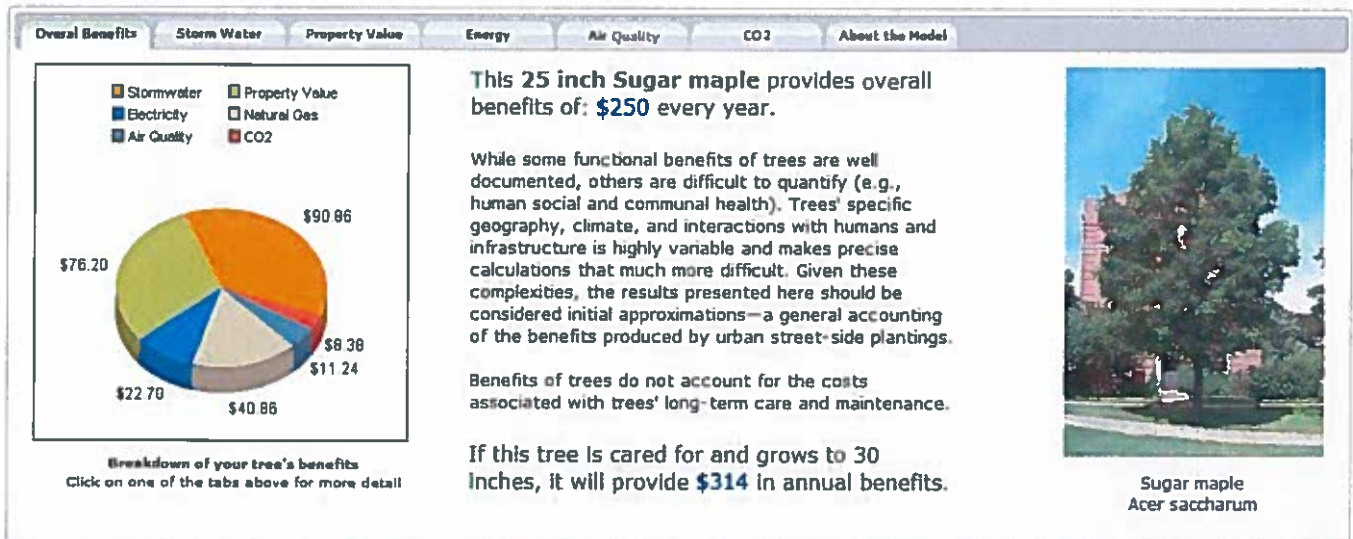
The National Tree Benefit Calculator was conceived and developed by Casey Trees and Davey Tree Expert Co.



[Home](#) [Calculate another tree](#)

National Tree Benefit Calculator

Beta



The National Tree Benefit Calculator was conceived and developed by Casey Trees and Davey Tree Expert Co.



Resources and Acknowledgments

Content:

Alig, R., et.al. (2010). *Conversion of Forest Land: Trends, Determinants, Projections, and Policy Considerations*. Found online at http://www.fs.fed.us/pnw/pubs/gtr802/Vol1/pnw_gtr802vol1_alig.pdf

Alliance for Community Trees. *Clinical Benefits of Trees Tied to Reduced Stress, Faster Surgery Recovery, and Decreased Use of Pain Killers*. Found online at <http://actrees.org/news/trees-in-the-news/research>. Search for article by title.

American Forests Register of Big Trees. Found online at: <http://www.americanforests.org/our-programs/bigtree>

Arbor Day Foundation. Found online at <http://www.arborday.org>.

Arbor Day Foundation. *The Value of Trees to a Community*. Found online at <http://www.arborday.org/trees/Benefits.cfm>

Casey Trees, Davey Tree Expert Co. *National Tree Benefit Calculator*. Found online at <http://www.treebenefits.com/calculator>

Kansas Forest Service.

- *Kansas Forest Action Plan*. Found online at http://www.kansasforests.org/kansas_forest_services/kfs_docs/Kansas_FRAS.pdf
- *Kansas Champion Tree Program*. Found online at http://www.kansasforests.org/kansas_forest_services/championtrees.html

Texas A&M Forest Service. *Leaf Collecting and Safety*. Found online at <http://texastreeid.tamu.edu/content/leafCollectingSafety>

Pacific Northwest Chapter, International Society of Arboriculture. *Trees Are Good for Business*. Found online at <http://naturewithin.info/CityBiz/BizTech.pdf>

United States Census Bureau. Found online at http://www.census.gov/newsroom/releases/archives/2010_census/cb12-50.html

United States Environmental Protection Agency. *What is Nonpoint Source Pollution?* Found online at <http://water.epa.gov/polwaste/nps/whatis.cfm>

USDA Forest Service. *Forest Service Open Space Conservation Strategy: Cooperating across boundaries to sustain working and natural landscapes*. Found online at http://www.fs.fed.us/openspace/OS_Strategy_final_web.pdf

University of Illinois at Urbana-Champaign. Landscape and Human Health Laboratory. Found online at <http://lhhl.illinois.edu>

University of Washington, School of Environmental and Forest Sciences. *Human Dimensions of Urban Forestry and Urban Greening*. Found online at <http://www.naturewithin.info>

USDA Forest Service. Northern Research Station. *Assessing Urban Forest Effects and Values: Douglas County, Kansas*. Found online at http://www.fs.fed.us/nrs/pubs/rb/rb_nrs91.pdf

USDA Forest Service. Northeastern Area. Urban and Community Forestry Program. Found online at <http://na.fs.fed.us/urban/index.shtm>

USDA Forest Service. Pacific Southwest Research Station. *Midwest Community Tree Guide: Benefits, Costs and Strategic Planting*. Found online at http://www.fs.fed.us/psw/publications/documents/psw_gtr199/psw_gtr199.pdf

Images:

Arbor Day Foundation.

Kansas Forest Service: Kim Bomberger, Bob Atchison

Step 2

Create a Poster

Trees are Terrific...in Kansas Cities and Towns!

Contest Deadline: February 5, 2016

Send local-winning posters to Kansas Forest Service District/ Community Foresters on page 29.

Kansas College and Career Ready Standard Supported:

SL.5.5 – Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.

Contest Administration and Selection

The Kansas Arbor Day Poster Contest is administered by the Kansas Forest Service. Local-winning posters are to be submitted to Kansas Forest Service Community/District Foresters for competition at the district level. A state winner will be selected from the six district-winning entries. District winners and their teachers will receive robust gift packages sponsored by contest partners. The Kansas Winner will be recognized at the Tree City USA Recognition in the spring. A request is made each year for the State Winner to meet with the Governor and plant a tree on the Capitol grounds.



Create a Poster

Ask each student to create a poster that reflects his or her understanding of the benefits of trees in their community. Encourage students to think about the different type of trees that grow in your town and how they work for citizens and visitors alike.

Have students begin their process by conducting research on the benefits of trees. Students should use this research to help determine which elements that they wish to represent in their poster. For example, if they want to show that trees conserve energy, they should determine that the design elements should include a house or commercial building and that deciduous trees should be placed on the west side of the building for summer cooling or evergreen trees placed on the north for winter protection. After students have created their posters, have them present their posters to the class or to a contest selection committee and discuss the process they used to decide which design elements to include in their poster and their rationale.

Students should make sure that their poster follows the contest rules by using the numbered list on page 26. You may select the winner or have a judging panel for the classroom and school contest. Judges could include other students, garden club members, tree board members, nursery personnel, arborists, the city forester, teachers, PTA/PTO members or individuals with an interest in trees who are willing to volunteer some time.

Poster Contest Rules

Follow the contest rules below to make certain all entries are eligible for judging. Entries not meeting these guidelines will be disqualified.

1. All entries must be original artwork created by a student who is currently in the **fifth (5th) grade**. A student may enter the contest only once.
2. **The student's first and last name must be written or signed in the lower right-hand corner on the front of the poster.**
3.
 - a) Entries may be done in marker, crayon, paint pens, watercolor, ink, acrylic, colored pencil, and/or tempera paint.
 - b) Collages are not acceptable. (Do not glue anything to your poster).
 - c) Computer or photo-generated art and/or printing are not acceptable.
4. Entries must be no smaller than 8 ½ x 11" and no larger than 14 x 18".
5. Entries must be done on paper that will allow for duplication, display, and framing.
6. The poster must be related to the contest theme and content in some way. The theme **Trees are Terrific...in Kansas Cities and Towns!** must be on the poster. All words must be spelled correctly.
7. Entries should not be matted, mounted, laminated, framed, or folded!
8. **Submit local-winning entries to a Kansas Forest Service District/Community Forester by February 5, 2016 (page 29).**
Deadlines for local contests should be earlier than February 5, 2016 to ensure timely arrival to a KFS forester office.

School Winner Report Form

After selecting a school or local winner, copy and complete this form, attach it to the back of the poster, and send to a Kansas Forest Service District/ Community Forester (page 29) by February 5, 2016.

2016 School Winner Report Form

Send this form with the winning school or community poster to your KFS District/ Community Forester. All information should be complete to expedite contact of winners.

Winner's Name _____

Winner's Home Address _____

City _____ Kansas Zip _____

Winner's parent or guardian name _____

Teacher's name _____

Teacher's email address _____

School name _____

School Address _____

City _____ Kansas 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.

Step 3

Celebrate Arbor Day!

Kansas Arbor Day is April 29, 2016

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. Check to see if your city is a Tree City USA community and team up with a local tree board!

Inspiring: Have your graduating class plant a tree with 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 (<http://www.arborday.org/celebrate/celebration-materials.cfm>). Ask your music teacher if he or she knows songs about trees or Arbor Day and have a musical program dedicated to trees!

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



*Kentucky coffeetree in
Fairgrounds Park, Council Grove*

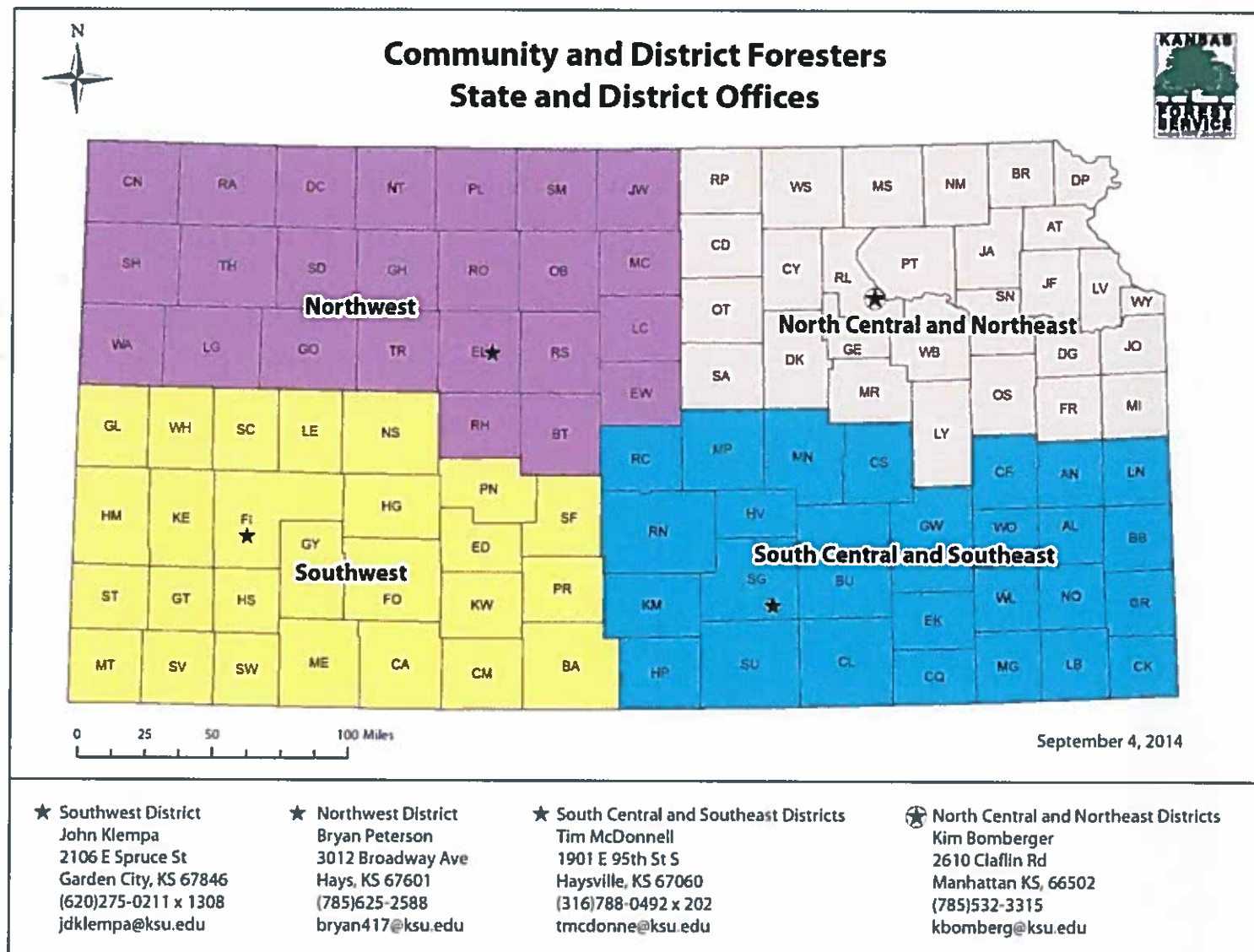


Bur oak in Shunga Park, Topeka



State Champion Ginkgo, Leavenworth

Kansas Forest Service Community Forestry District Offices



Emerald Ash Borer
Management Plan

The City of Lenexa's EAB Management Plan

The City of Lenexa has made a continued commitment to preserve and maintain trees on city property. Evidence of this commitment includes our street tree ordinance, which requires one (1) street tree be planted for every 40 feet of public or private street frontage and the city's ongoing status as a Tree City USA community since 1988.

This management plan will serve as the City of Lenexa's guide to manage the city's publicly-owned ash trees and how the city will work with the property owners to manage private ash trees. The goal of this plan is to take a proactive, methodical, and measured approach to slow the spread of the Emerald Ash Borer (EAB) in Lenexa, while attempting to minimize the impact of tree loss to Lenexa's neighborhoods. This management plan recognizes three important facts:

1. Infested and other distressed ash trees are a haven for the EAB and can promote the spread of the insect to other healthy trees; therefore these ash trees on public property must be removed.
2. Healthy ash trees that are not showing signs of distress or infestation are a positive part of Lenexa's urban forest. These trees will be preventatively treated and will remain until they are no longer healthy or infested, and then will be removed. This will help slow the loss of tree canopy in Lenexa's neighborhoods.
3. The removal of ash trees from our urban forest will change the landscape of the community. Reforestation where ash trees have been removed is essential for maintaining the appeal of our neighborhoods and emphasizing our continued commitment to the environment.

The management plan includes specific procedures the City of Lenexa will implement to manage the spread of the EAB within its borders. Included with the procedures in this management plan are tables identifying the potential financial impact of each component. The potential financial impact values identified herein are for planning purposes only and are subject to change as infestations of the EAB are found. To make the management plan easier to use it is separated into the following five key components:

1. Resident & Business Outreach and Education
2. City-Owned Ash Trees
3. Privately Owned Ash Trees
4. Updating of the EAB Management Plan
5. Important Contact Information

Resident & Business Outreach and Education

The City of Lenexa is committed to reaching out to residents and businesses and educating them about EAB and the impact it poses to Lenexa's urban forest, the city's actions to slow the spread of the EAB, and options for residents and businesses with private ash trees.

Outreach and education requires the resources of multiple departments including Communications, Community Development, and Parks & Recreation. These resources will be used to create and implement the following informational tools:

Informational Tool	Description
Informational Displays	When infestation increases, display boards will be put up at public facilities.
Door Hangers and Brochures	Distribution of informational door hangers will begin January 2014.
Newsletter Article	We will continue to use the <i>Lenexa Town Talk</i> and the <i>My Lenexa News</i> e-newsletter when new or pertinent information is available regarding EAB.
City Website	A webpage has been developed and will be continuously updated with current information.
Email Blasts	This will be used to inform Home Owner Associations.
Onsite Resident Meetings	If a request is made, a parks staff member will meet onsite with residents to answer questions and provide guidance as time and funding permits.
Presentations	City staff will have opportunities to educate local groups.

City-Owned Ash Trees

Overview:

The City of Lenexa has approximately 8,500 ash trees in our tree inventory and 468 in its parks, medians, and public building properties. The tree inventory, which is not all-inclusive, is of all city-owned trees and trees within the 15-foot landscape easement along city streets. This does not include heavily wooded areas and anything further back of that 15 feet (private property). The ash trees are a major concern because the majority of them are in highly visible areas along heavily traveled streets, and they represent more than 20 percent of our approximate 40,000 inventoried trees. To help slow the spread of the EAB, the city is taking a proactive, multi-faceted approach that will include: surveying of all city-owned ash trees, insecticide treatment of desired ash trees, removal of dead or declining trees, and replanting with acceptable trees where ash trees were removed.

Survey:

In March 2014, the Parks Department completed a survey of all city-owned ash trees from parks, medians, and public buildings and created a current benchmark of their condition. Employees (who hold the Certified Arborist Credential) assigned each tree a condition rating and measured the DBH (diameter at breast height). Attributes that were considered when assigning a rating were, but not limited to, leaf density, structural integrity, environmental stresses, apparent cavities, root

flare/collar condition, crown dieback, fungal infections, insect damage, nutrient deficiencies, and heaving soil. This information was then used to categorize each tree on a scale of 1 to 3 (see table below). Trees rated 1 or 2 will be inspected on an annual basis and the results will be used to plan for continued treatment, monitoring, or removal of the ash tree. Trees rated a 3 will be scheduled to be removed and replaced as resources permit.

Tree Condition Rating Scale

Scale	1	2	3
Condition	Good Condition	Fair Condition	Poor Condition

Treatment:

Beginning in the spring of 2014, ash trees that are deemed desirable and rated a 1 or 2 with a trunk diameter of greater than 6 inches will receive an insecticide treatment. Each treatment is estimated to cost approximately \$60 per tree. The City of Lenexa will make a significant investment in the health of these trees and all will be candidates for retreatment on an annual or biennial basis, depending on the product used for treatment. The treatment of these trees will be with a trunk injection or soil drench of a proven insecticide. After each treatment and prior to additional treatments, parks staff will inspect the condition of the treated trees to determine the success level.

Tree Removal:

The City of Lenexa will use a combination of city resources and contractual services to remove 124 ash trees that were determined to be not desired, were rated a 3, and all trees that have a DBH of 6 inches or less. Estimated cost of removal will be anywhere from \$200-\$1,200 per tree, depending on size and location. City staff will also remove all stumps. All trees rated 1 or 2 will continue to be monitored on an annual basis, if these trees become infested by EAB or their conditions decline, they will also be removed. The city plans to have all removals completed by the end of 2015.

Reforestation:

City-owned ash trees removed as part of the EAB Management Plan will be replaced over time. The Parks Department's goal will be to replant trees within 18 months of the removal; however, replanting will be contingent on available funding. Replacement trees will be between a 2-inch and 3.5-inch caliper and will be planted by city staff or by a qualified contractor, depending on available resources. The estimated replacement costs will be approximately \$350 per tree. The following chart is a sample of acceptable tree species that could be used to replace the ash trees. Location, spacing, and the site conditions will be considered by the Parks Superintendent and/or the Landscape Supervisor for proper species selection and placement.

Common Name	Scientific Name
Norway Maple	<i>Acer platanoides</i>
Black Gum or Black Tupelo	<i>Nyssa sylvatica</i>
Bald Cypress	<i>Taxodium distichum</i>
Saw Tooth Oak	<i>Quercus acutissima</i>
Sugar Maple	<i>Acer saccharum</i>
Greenspire Littleleaf Linden	<i>Tilia cordata</i> 'Greenspire'
Greenvase Japanese Zelkova	<i>Zelkova serrata</i> 'Green Vase'
Shademaster Locust	<i>Gelitsia triacanthos</i> var <i>inermis</i> 'Shademaster'
Swamp White Oak	<i>Quercus bicolor</i>
Shingle Oak	<i>Quercus imbricaria</i>
White Oak	<i>Quercus alba</i>
Triumph Elm	<i>Ulmus</i> 'Morton Glossy'

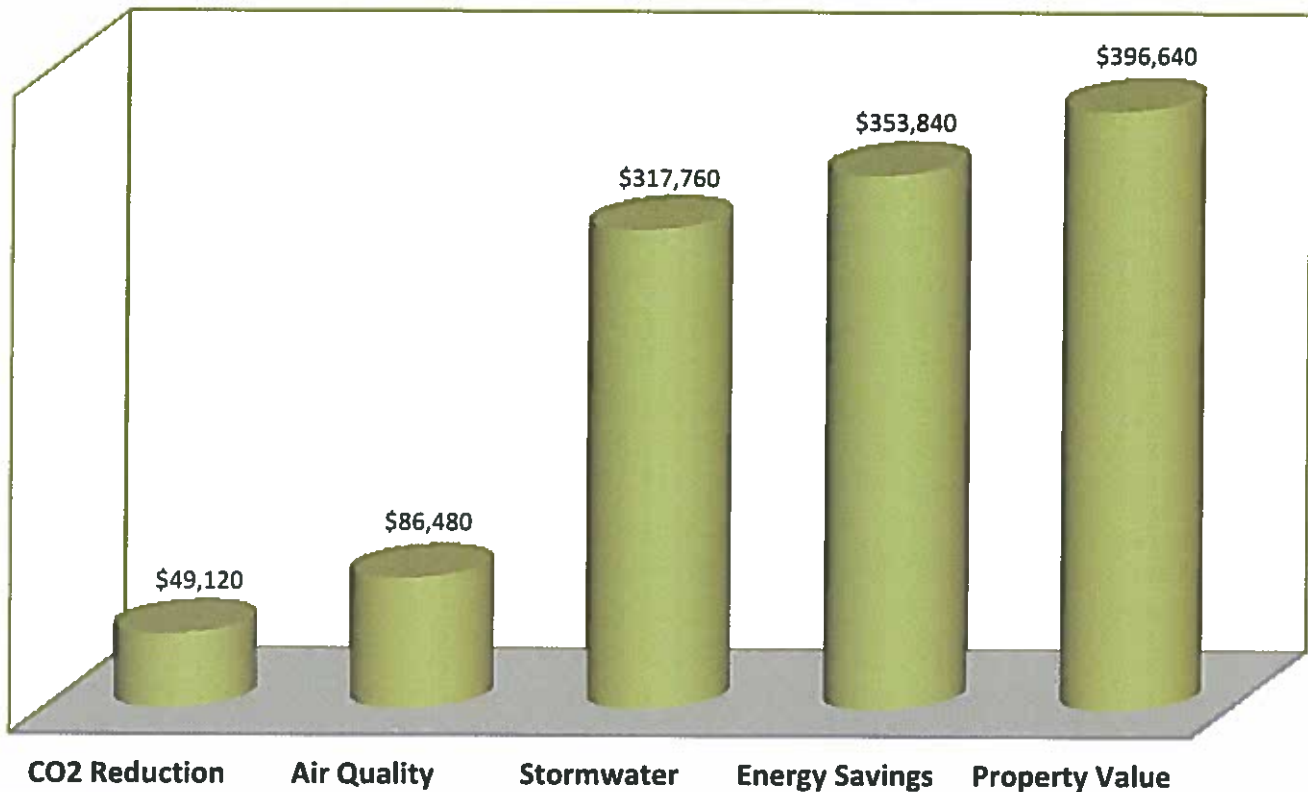
Management Plan Implementation Costs:

The costs involved in implementing this management plan will include: the cost to preventatively treat all desired trees with insecticides, the costs involved in removal and disposal of all poorly rated and/or infested ash trees, and the costs associated with replacing trees that were removed. These costs will be fairly substantial, but necessary for the proper management of our urban forest.

Privately Owned Ash Trees (Includes Right-of-Way Street Trees):

The City of Lenexa recognizes that many residences and businesses may have ash trees on their property. There are approximately 8,000 ash trees in the city's right-of-ways alone. These trees were run through a tree benefit calculator. This calculator provides a variety of information, including total annual benefits that a tree provides, which includes such benefits as energy savings, CO2 reduction, air quality control, stormwater runoff, and increased property values. Assuming an average DBH of 15 inches, the total replacement value for these ROW trees would be \$11,976,315 and their annual benefits exceed \$1,200,000. The loss of these trees would also have a significant impact on property values in the City of Lenexa.

Annual Benefits of Ash Trees in R.O.W.



Ash trees represent more than 20% of Lenexa's urban forest and are the most populous genus (*Fraxinus*). Second is maple (*Acer*). Although the city does recognize the benefits these trees provide, it does not treat or remove trees on private property. However, if the owner suspects that their ash tree might be infested with the EAB, they are asked to contact the Kansas Department of Agriculture, the local extension office, or a local certified arborist. Contact information is available on page 9 of this plan.

Consultation/Removal:

Upon request, a City of Lenexa certified arborist from the Parks Department will meet with property owners to help them determine if a tree on private property is an ash tree. General assessments will be offered on the health of the tree, questions will be answered, and residents will be advised on whom to contact for more specific diagnoses and treatment options.

If clear signs of the EAB are found on the tree in question during a consultation, the Parks Superintendent and/or Landscape Supervisor will notify the property owner and the city's Code Enforcement that the tree has been infested and will need to be removed. Removal of the EAB infected tree is the responsibility of the homeowner. The EAB infected tree(s) must be removed using methods approved by the Kansas Department of Agriculture. The Code Enforcement Department will send a follow up letter to the owner identifying the steps the resident must take to have the tree removed. See City Ordinance Section 4-1-D-2 R-5-B for full details.

Consultations will be scheduled as requested and as staff time allows. There is no cost for consultation with the Parks Department staff.

Treatment:

Property owners are able and encouraged to treat their private ash trees. These treatments are most effective as a preventative measure. Three common chemical treatments used for the EAB include: Imidacloprid (Merit, Xytect); Emamectin benzoate (TREE-age); or Dinotefuran (Safari, Transtect, Zylam). Owners wishing to treat their private trees should contact an arborist certified by the International Society of Arboriculture (ISA) and/or the Kansas Arborist Association (KAA), who is also a Licensed Certified Pesticide Applicator by the Kansas Department of Agriculture, to discuss which treatment option is the best for their tree(s).

However, no treatment can be guaranteed to be 100% effective. If an infestation occurs, the property owner will be required to remove the tree. Residents or businesses that are required to remove their tree(s) due to infestation will not be reimbursed by the City of Lenexa for any treatment costs that were incurred.

Street Tree Replacement:

Due to the devastating nature of the emerald ash borer and the thousands of ash trees along our city's streets that will die once infested, the City of Lenexa has developed a replacement refund program for these ash trees. In order to help preserve Lenexa's urban forest and help ensure that property values do not drastically decline, the city plans to use excess funding from the Street Tree Fund to help ease the financial burden to property owners. The city is encouraging property owners who either replace their street trees that were removed due to EAB infestation or who proactively replace their tree to a non-susceptible species by providing a refund of 50% of the cost, up to \$200 per property.

In order to receive the refund, property owners must be replacing an Ash tree and must get pre-approval from the Parks Superintendent and/or Landscape Supervisor on the location of the tree planting. The property owner must replace with an approved tree species from the list above or a tree species that has been pre-approved. The property owner may purchase their tree where they prefer, but a valid receipt must be provided in order to receive the refund. The tree will need to be planted in accordance with city code and remain a street tree. Prior to issuing a refund, an employee from the Parks Department will visit the property to verify the street tree has been planted. Refund checks will be mailed to the property address and may take up to 4 weeks.

A set reserve amount per district will remain in the street tree fund. Once funds in excess of the reserve amount are exhausted, the refund to property owners will no longer be available.

Updating of this Management Plan:

This management plan will be reviewed by the Parks Superintendent or his/her designee and the Director of Parks & Recreation on an annual basis to determine if the plan is commensurate with the infestation level.

Important Contacts and Informational Websites:

City of Lenexa
Parks and Recreation
Department

www.lenexa.com
913.477.7141

Kansas State Research
and Extension

www.johnson.ksu.edu
913.715.7000

Kansas Forest Service

www.tinyurl.com/nxbmxtl
785.564.6698

Kansas
Department of Agriculture

www.tinyurl.com/np4e68q
785.296.3556

Kansas Arborists
Association

www.kansasarborist.com

International
Society of Arboriculture

www.isa-arbor.com

United States
Department of Agriculture

www.stopthebeetle.info

Emerald Ash Borer Information

www.emeraldashborer.info