


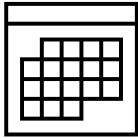







HOW TO REQUEST SCHOOL TREES

STEPS		STUDENT ACTIVITIES
<p>PRINCIPAL SUPPORT</p> <p>MNPS supports planting trees at schools with principal approval. Trees, planting, and two years of watering support are free of charge.</p>		<p>LETTER WRITING CAMPAIGN</p> <p>Students write persuasive, research-based letters to the principal to request new trees.</p>
<p>IDENTIFY TREES & LOCATIONS</p> <p>Your school can request trees from our preferred list or suggest others. You can also suggest preferred locations.</p>		<p>USING TREES TO REDUCE HEAT ISLANDS, STORMWATER IMPACT OF TREES</p> <p>Students consult tree lists and school campus map to suggest specific trees and locations.</p>
<p>CONTACT METRO WATER SERVICES</p> <p>Email sarah.welz@nashville.gov to request trees for your school.</p>		<p>Teacher can choose the best persuasive letters to share with Metro Water Services</p>
<p>SITE MEETING</p> <p>Walk the site with a Metro Water Services Arborist to discuss tree locations and species selection.</p>		<p>Teachers will learn about Metro Water Services' recommendations for new trees and share the information with students.</p>
<p>METRO WATER SERVICES WILL HANDLE THE DETAILS</p>		<p>Funding, tree acquisition, planting, care plan – Metro Water Services will take care of the logistics.</p>
<p>TREE CARE</p>		<p>TREE ADOPTION & CARE ACTIVITY</p> <p>Classes participate in adopting and caring for a new tree.</p>
<p>ENJOY YOUR TREES AND LEARN FROM THEM</p>		<p>LEARNING RESOURCES</p> <p>Students continue to learn about their trees.</p>

LETTER WRITING CAMPAIGN TO REQUEST TREES

LEARNING OBJECTIVE

Students will create a persuasive argument in favor of adding new trees to the school campus.

ASSESSMENT

- Students create a list of benefits of trees to the school campus.
- Students create a list of trees to add to the campus.
- Students use their lists to write a persuasive letter to the principal to request permission to add specific trees to their campus.

Introduction

Create small groups of students and ask them to hold a discussion about trees on their campus addressing these questions:

- Do you have a favorite tree on the campus? Why is this your favorite tree?
- Would you like to have more trees on campus? Why or why not?

Ask small groups to record the information on a poster.

- Alternate activity for younger students: Hold a class discussion and create a drawing.

Extension activity: Take the class for a walk around the campus to look at the trees.

Research the Benefits of Trees

Introduce to the students that the goal of this research and summarizing activity is to describe the how trees benefit the school the school.

Working as an entire class or in small groups, [research the Benefits of Trees](#) and create a list answering the question, "How do trees benefit our school campus?" Add this information to the poster from the previous activity.

Alternate activity for younger students: Hold a class discussion and create a drawing.

LETTER WRITING CAMPAIGN TO REQUEST TREES

Research Trees for School Planting

Inform the students that Metro Water Services would like to plant trees on the school campus. The students can suggest trees they would like to have planted.

Working as an entire class, or in groups of 3 or 4, have the students research and choose 3 - 5 trees from [the tree database](#) they would like to have planted at the school. Students will create a list of their tree choices. For each tree, students will answer these questions:

- Why is this a good tree for the school?
- What is something we could learn from having this tree at school?

Add this information to the poster from the previous activity.

Post the lists around the room.

NOTE: Metro Water Services will make a good faith effort to include student tree selections in the planting plan. Some trees may need to be substituted due to site conditions and tree availability at planting time.

Gallery Walk

Have all groups leave their lists on their tables or hang them up on the walls.

Ask students to walk around and review the lists.

Regroup as a whole group and discuss:

- What did you notice that was common across lists?
- What differences stood out?
- What questions do we have?

Make a question board that collects all of their questions.

Persuasive Letter Writing

Students will use their lists on benefits of trees and tree choices to write a persuasive letter to the Principal asking permission to allow Metro Water Services to plant specific trees on the school campus.

The teacher will share the student tree choices with Metro Water Services to consider planting at the school.

Note: Metro Water Services may choose alternate trees that have a better chance of surviving and thriving at the school.

USING TREES TO DECREASE HEAT ISLANDS

LEARNING OBJECTIVE

Students will show the relationship between shade and temperature, learn about heat islands, and consider how trees can mitigate the heat island effect to keep our school campus cooler.

ASSESSMENT

- Students construct a model of different temperatures on their school campus.
- Students add tree-based solutions to their model to mitigate heat on the campus.

VOCABULARY

Heat Island Heat islands are urbanized areas that experience higher temperatures than outlying areas. Structures such as buildings, roads, and other infrastructure absorb and re-emit the sun's heat more than natural landscapes such as forests and water bodies.

INTRODUCTION

Elementary Classes: Story and Discussion

Ms. Heater, a third-grade teacher, decided to hold class outside. The students were very excited. They took their supplies, lined up, and went outside. First, they went to the sidewalk in front of the school front door and sat down. "Ouch," the students complained, the sidewalk is too hot to sit down. Next, they went to the picnic tables to sit down. The seats were comfortable, and they started to work on the lesson. Soon, the students had sweat running down their faces; "it's too hot," they complained.

"If you are too hot, we can go back inside," suggested the teacher. The students wanted to stay outside, but they had to find a place where it would be cooler. The students came up with a plan - "Let's use science to decide where to sit."

Discussion:

- Which scientific measuring tool can you use to measure the temperature in different areas?
- What can we use to keep track of where it is hotter and cooler on our campus?
- Introduce or review relevant vocabulary.

Older Students:

- Introduce the concept of Heat Islands and begin the modeling activity.

Initial Model

Introduce the goal of the modeling activity is to represent where it is hotter and cooler on the school campus.

Have a discussion about modeling conventions:

- How should hotter areas be represented on the map?
- How should cooler/more comfortable areas be represented on the map?

Decide if the activity will be for small groups or for the entire class.

Use Google Maps to locate and print a map of the school property. Either print one map for each group, or one large map for the entire class.

Working as an entire class or in small groups, look at a school map (or hand out the map to the students) and ask students to note on the map in 3 places they think it will be too hot to sit outside and 3 places they think it will be comfortable to sit outside.

USING TREES TO DECREASE HEAT ISLANDS

- Note: for younger students it may be helpful to choose two places in full sun and two places in shade, including under a tree.

Each student should understand what the model is showing so they can be prepared to explain their model during the gallery walk.

Gallery Walk

Have all groups leave their models on their tables or hang them up on the walls.

In two rounds, half of the group can stay with their model while the other half walks around the room and looks at all of the other models, noticing patterns that are common across models and key differences.

After everyone in the first round has seen all the other models, switch groupings.

Regroup as a whole group and discuss:

- What did you notice that was common across models?
- What differences stood out?
- What questions do we have?

Make a question board that collects all of their questions about stormwater runoff.

Data Collection

Prior to collecting data, discuss how to read and use a thermometer, and how to record the data on the map.

Have a discussion about how to collect and record the data.

- Where will the temperature be recorded on the map?
- What symbol will students use to indicate if they feel the area is hot or comfortable?

Working as an entire class, or in groups of 3 or 4, have the students collect data.

- Students will go to the locations they put on their initial map model.
- Place the thermometer on the ground and wait for a count of 30 seconds.
- Record the temperature on the map in the correct location.
- Repeat until data has been collected at all the locations.

MIDDLE AND HIGH SCHOOL GRADES EXTENSION:

Understanding Heat Islands

Review the webpage with students on [Heat Island Mapping and Nashville](#) and [Nashville Heat island story map](#)

Discuss [this graphic](#) showing heat differences by land type and hold a discussion:

- Why are some areas cooler or warmer than others?
- Which type of area do the students live in?
- Which type of area would students prefer to live in? Why?

USING TREES TO DECREASE HEAT ISLANDS

Read and discuss [the actions Metro Water Services is taking](#) to help lower temperatures in Nashville.

Using the Data

With the temperature data on the map, have students compare the data to their original model.

While discussing, have them identify:

- Which areas on the school campus are hotter?
- Which areas are cooler?
- What is it about the cooler areas that help keep them cool?

Inform the students that Metro Water Services has offered to plant trees at the school to help with the heat islands/help keep the campus cooler.

- Working as an entire class, or in small groups, use a blank school map to indicate where students would like to have trees planted to help cool the area.

The teacher will share the student tree planting location suggestions with Metro Water Services. Note: Metro Water Services may choose alternate locations for trees based on utility lines, soil, and other site conditions.

IMPACT OF TREES ON STORMWATER

LEARNING OBJECTIVE

Students will show the relationship between stormwater runoff and flash flooding and consider solutions to protect our neighborhoods from flash flooding.

ASSESSMENT

- Students construct a model of stormwater runoff on their school campus.
- Students add tree-based solutions to their model to mitigate stormwater runoff on the campus.

ACADEMIC VOCABULARY

Stormwater and Stormwater runoff - Stormwater, also referred to as runoff, surface water, or wet weather flow, is rain or snow that falls on streets, parking areas, rooftops and other hard surfaces.

Flash flooding - Flooding that begins within 6 hours, and often within 3 hours, of the heavy rainfall (or other cause).

Permeable - Allows liquids or gases to go through

Impermeable - Not allowing liquid or gas to go through

Rainfall Intercepted – Rain that falls on tree branches, leaves, and trunks instead of directly on the ground.

Introduction

Watch this video showing [flash flooding in West Nashville](#).

Review the article [“Flash Flooding: Be Ready to Act”](#)

1. Discuss the hazards caused by flash flooding.
2. Discuss flash flooding safety
3. Alternate activity for younger students: Use the [Loaner EnviroScape](#) to demonstrate flash flooding:
 - a) Demonstrate regular rain: rain slowly over the entire model and see how the stormwater runs off into the river.
 - b) Demonstrate flash flooding: dump an entire bottle of water quickly onto the model and see how it floods the streets and houses.
 - c) Discuss the definition of flash flooding.

Introduce vocabulary

Initial Model

Introduce to students that the goal of the modeling activity is to represent what causes stormwater runoff.

Have a discussion about modeling conventions:

- How should permeable areas be represented on the map?
- How should impermeable areas be represented on the map?

Use Google Maps to locate and print a map of the school property. Either print one map for each group, or one large map for the entire class.

Working as an entire class, or in small groups, look at a school map (or hand out the map to the students) and ask students to note on the map 3 places they think rain will soak into the ground (permeable) and 3 places they think rain will runoff and not soak into the ground (impermeable).

IMPACT OF TREES ON STORMWATER

Each student should understand what the model is showing so they can be prepared to explain their model during the gallery walk.

Gallery Walk

Have all groups leave their models on their tables or hang them up on the walls.

In two rounds, half of the group can stay with their model while the other half walks around the room and looks at all of the other models, noticing patterns that are common across models and key differences.

After everyone in the first round has seen all the other models, switch groupings.

Regroup as a whole group and discuss:

- What did you notice that was common across models?
- What differences stood out?
- What questions do we have?

Make a question board that collects all of their questions about stormwater runoff.

Understanding the role of trees and vegetation in reducing stormwater runoff

Review the vocabulary.

Display the [Runoff Simulator](#) (for younger students) or have students view the simulator in small groups (older students).

- Students will explore the simulator by clicking on the different land uses.
- Have students record the runoff totals for three land use types.

Land Cover Type	1.		2.		3.	
Precipitation Amount						
Runoff Amount						

Hold a class discussion:

- Which types of land have less runoff?
- Which types of land have more runoff?

Based on information from the runoff simulator, have students revise their school map by adding features that could reduce stormwater runoff.

IMPACT OF TREES ON STORMWATER

Choosing trees for stormwater runoff reduction

Inform the class that Metro Water Services will plant trees on the school campus for free. Students can help by recommending trees that will reduce stormwater runoff.

Working in small groups, each student will use the [Tree Database](#) to select four trees they would like to have on campus.

Students will use [MyTree](#) to calculate the amount of stormwater mitigation through runoff avoided and rainfall intercepted for each tree (follow instructions on next page). Based on this information, students will recommend which trees to plant on the school campus to mitigate stormwater.

Tree (enter these names in the tree name box)	Name of Tree #1	Name of Tree #2	Name of Tree #3	Name of Tree #4
BENEFITS – Click on the Benefits tab to see the data.				
Runoff Avoided (gallons)				
Rainfall intercepted				
EQUIVALENTS – Click on the Equivalents tab to see the data.				
Absorbs enough stormwater to fill _____ bathtubs				

Extension for high school students: Compare trees based on all the Tree Benefits listed on iTree and make an argument about which trees provide the most benefits to the school and the community.

The teacher will share the student tree choices with Metro Water Services to consider planting at the school.

Note: Metro Water Services may choose alternative trees that have a better chance of surviving and thriving at the school.

IMPACT OF TREES ON STORMWATER

Instructions for using My Tree

1. Enter this address into your browser:

<https://mytree.itreetools.org>

2. Click on the Get Started button.

3. Enter an address in the search bar.

Where is your tree?



4. Click on

Next, describe your tree →

5. Enter a tree name in the box.

Use the tree names on the data collection workset.

Try: "Oak" or "Maple"

6. Enter trunk size in the the box (use 2 inches)

Leave the other information as it is and scroll to the bottom.

Trunk Size (in.)*

7. Click on

Add more trees or get results →

8. Get results by clicking on the blue calculator button



9. Record the information on the data table.

10. Repeat with the next tree and complete the data table.

The screenshot shows the 'MyTree Benefits' results for a Maple tree. At the top, there are two tabs: 'Now' (selected) and '20 Years'. Below the tabs are two buttons: 'Benefits' and 'Equivalents'. The main content area displays the following information:

- MyTree Benefits** (with i-Free logo)
- Over 20 years.**
- Maple spp, (*Acer*)
- Serving Size:** 1.00 in. diameter
- Condition:** Excellent
- Location:** Washington, Dc, United States
- Expected i-Tree benefits over 20 years:** \$121.67
- Discover benefits of all your [community trees!](#)

PROTECTING OUR NEW TREES

LEARNING OBJECTIVE

Students will show what trees need to survive and thrive and hazards facing urban trees and consider solutions to protect the trees on their campus.

ASSESSMENT

- Students construct a model showing tree needs and hazards.
- Students add solutions to their model to mitigate hazards to trees on the campus.

ACADEMIC VOCABULARY

Arborist - an individual trained in the art and science of planting, caring for, and maintaining individual trees

Introduction to tree needs and care

Middle and high school – Read about tree care (mulching and watering)

Elementary School – Hold a discussion on what plants need to live.

Introduction to hazards to trees on school campuses

Hold a discussion about things that can happen to trees on the school campus that would damage the trees or make it difficult for them to survive.

Talking points:

- Watering – trees need 10 gallons of water each week, either from rain or from watering. New trees can be weakened and die from inadequate watering.
- Harm from deer (if applicable in your area). Deer rub against tree trunks and can damage young trees.
- Harm from people: mowing and string trimming too close to the trunk, and breaking limbs.

Initial Model

Introduce the goal of the modeling activity is to represent what trees need to survive.

Working as an entire class, or in small groups, ask students to create a poster showing what trees need and what can harm trees.

Each student should understand what the model is showing so they can be prepared to explain their model during the gallery walk.

Gallery Walk

Have all groups leave their posters on their tables or hang them up on the walls.

In two rounds, half of the group can stay with their poster while the other half walks around the room and looks at all of the other models, noticing patterns that are common across posters and key differences.

After everyone in the first round has seen all the other models, switch groupings.

Regroup as a whole group and discuss:

- What did you notice that was common across models?

PROTECTING OUR NEW TREES

- What differences stood out?
- What questions do we have?

Make a question board that collects all of their questions about tree needs and hazards.

Understanding the role arborists play in caring for trees.

See [arborists at work](#) and see [A Day in the Life of an Arborist](#).

Learn about the [arborist career](#).

See the [Job Listings](#) on the International Society of Arboriculture website.

Engineering Design to help trees survive and thrive

Inform the class that Metro Water Services will plant trees on the school campus for free. Students can help the trees survive by designing a device to help the trees survive.

- Review the students' ideas on what trees need to survive.
- Review the students' ideas on the hazards trees face.

Set the expectations for the final design (drawing, 3-D model, PowerPoint, etc.)

Tree Adoption & Care Program

Background: The goal of the Tree Adoption & Care Program is to encourage a personal relationship between students and the new trees to help protect the young trees from harm.

Procedures:

1. Determine which classes will adopt & care for one of the school's new trees. Science classes may be the best fit; the activity includes data collection.
2. Each Class will choose a tree from the final map provided by Metro Water Services.
3. Tasks for each class:
 - a. Creating and implementing a tree care plan – see forms and data collection sheets on the next page.
 - b. Choose a name for the tree (encourage silly, meaningful, or other fun types of names).
 - c. Painting a name sign for the tree.
 - d. Creating and implementing a tree care plan.
 - e. Decorating the tree for a contest.

TREE ADOPTION AND CARE RECORDS

1. Choose a name for your class tree: Our tree is named:

2. Choose a head forester and foresters for the class.

This person’s job is to determine how to care for the tree, make sure the procedure is followed, and ensure data is collected.

This person should be responsible and a good leader.

The **head forester** for our class is _____.

Each head forester can be assisted by one or more **foresters**.

Foresters will take care of the tree. This includes watering the tree, monitoring it for pests or changes, and recording data.

The **foresters** for our class are _____

_____.

The head forester and foresters are also responsible for arranging for the maintenance of the tree and its area (sign, mulch, trash) and reporting any issues to their teacher.

3. The head forester and foresters will make a tree care plan.

What does the tree need? How can the class provide those things? How often should the tree be examined for changes or pests? How often should the tree be watered? How often should the area be maintained. (Write or draw the plan).

Background on tree care:

- Watering – trees need 10 gallons of water each week, either from rain or from watering. New trees can be weakened and die from inadequate watering.
- Harm from deer (if applicable in your area). Deer rub against tree trunks and can damage young trees.
- Harm from people: mowing and string trimming too close to the trunk, and breaking limbs.

Adopt-a-Tree Data Sheet

Page 1 of

Class: _____ Tree Name: _____

Tree Species: _____ Location: _____

Date	Weather (temperature, clouds, precipitation, etc)	Care Provided (water, visual inspection, mulch, etc)	Notes:
Date	Weather (temperature, clouds, precipitation, etc)	Care Provided (water, visual inspection, mulch, etc)	Notes:
Date	Weather (temperature, clouds, precipitation, etc)	Care Provided (water, visual inspection, mulch, etc)	Notes:
Date	Weather (temperature, clouds, precipitation, etc)	Care Provided (water, visual inspection, mulch, etc)	Notes:

LEARNING RESOURCES

Local Resources

[Nashville Tree Foundation](#)

[Root Nashville Campaign](#)

National Resources

Arbor Day Foundation – [Tree Campus k-12](#) and [Tree Education Hub](#)

[Teaching with iTree](#)

Sacramento Tree Foundation [Seed to Seedling Curriculum](#)

[Project Learning Tree](#)

National Environmental Education Foundation (NEEF) -[Tree Toolkit: Lessons and Educator Resources for Teaching About Trees](#)