

# Urban Trees in the Classroom



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# Part I: City of Des Moines Forestry Department

The Des Moines City Forestry Department works with many other departments to ensure the health of the City's urban forest which is found along city streets and public parks throughout Des Moines. Their mission is to maintain a healthy urban forest by providing expert maintenance for the trees owned by the City or found in the right-of-way. They also offer support to residents and community members who would like to help us grow and maintain our urban canopy. Volunteers play a vital role in the forestry's mission. There are several groups that work with the forestry department such as Trees Forever and individual volunteers through the TreeKeeper program.



## Part II: Workplace Focus

The Forestry Department is in charge of over 50,000 trees that are located along the streets in the right of way which is the area between the sidewalk and the streets and in the cities parks. The urban canopy is so important to providing neighborhoods with shade which promotes a sense of community and pride. It is important to perform site analyses correctly so you plan the trees in the correct place that will not interfere with important infrastructure as it grows. It is also important to plant a variety of species of trees to promote biodiversity. This is a good way to ensure we have plenty of trees even if one species is infected with a disease that might wipe it out such as the Emerald Ash Bore that affected so many Ash Trees across the country.



## Part III: Introduce the Problem

One of the problems and goals for the cities Forestry Department is to increase the urban canopy in the city's right of way and city parks. There are currently over 8000 vacant spots for trees in these areas across the city. With the current budget allotted to the department there is a need to find cost effective solutions for this this problem to fill as many vacant spots as possible within the current budget.

An answer to this problem is the Forestry Department's Tiny Tree Program. This program uses tiny trees to fill these spots that cost under \$10 to plant as opposed to the bigger nursery trees that cost \$250-\$300 each to plant. This tiny tree program uses trees that have been grown in a gravel nursery bed on city property. Once they are big enough to transplant, these trees can be transported in smaller vehicles and do not require big equipment and a crew to plant them. They can be planted by just one person.

# The Project

Our school project will be to create a gravel nursery bed on our school's campus and grow a variety of trees in this nursery to help with the project. This will require that we do research into the different types of trees that would thrive in our environment and learn about the importance of biodiversity. We will do this by studying the Dutch Elm Dieses and the Emerald Ash Bohr that has infested our Ash trees. Then we can work with the Forestry Department to help identify neighborhoods where these trees could be planted. We will then learn how to do site analyses to mark the spots where these trees would be appropriate to plant. We will conduct soil analyses to be sure the trees will have the correct nutrients in the soil to thrive. We will then (working closely with the Forestry Department) take our trees out to the neighborhood and plant them. We will closely monitor their condition and track how they are growing or if they have died.

Along with this project we will learn the many benefits of planting trees in neighborhoods and why it is important to develop a good urban canopy within a city.

# Tracking

We will keep very close records of our data when tracking these trees that we have grown and planted. We will study our data to see if there are any trends such as a specific variety of tree that just doesn't seem to tolerate transplanting in full sunshine or a particularly hardy tree that seems to grow in a wide variety of settings. We will share this data with the Forestry Department to use when they go out to plant trees.



# Part IV: Standards, Driving and Essential Questions

- **MS-ESS3-3 8<sup>th</sup> grade**- Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
  - Guiding question: How can increasing the number of trees in an urban setting help decrease our impact on the environment, benefit communities and help a city's budget.
- **MS-ESS3-5 8<sup>th</sup> grade** - Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.  
Guiding question: How does increasing the number of trees in a community have positive impacts on the local and global environment.
- **MS-LS2-3 7<sup>th</sup> grade** - Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.  
Guiding question: How does energy flow through the living organisms in our environment and how do trees play a central role in this transfer of energy?

## Part V: Extern Host Role

We will work very closely with Des Moines Forestry Department including Shane McQuillan and Tanner at Urban Ambassadors to help determine what neighborhoods to plant the trees, recommendations on when and what varieties to plant and having these professionals there to teach my students the best ways to plant the trees. We will also work closely to make sure our trees are placed on TreeKeeper and any extra trees we have planted get used else where in the city that they are needed.

I envision this to be a ongoing project so these trees can be continually planted in our gravel nursery bed and grown year after year to help replace trees and fill vacant spots around the city.





## Part VI: Student Learning

This project will be student focused and led. They will be responsible for doing the research, tracking the data, working with the different groups, selecting the trees and building/maintaining the gravel nursery bed on our campus. They will solve problems along the way and innovate solutions or new ways to accomplish our goals. One of the first projects will be for my students to design a funnel that will help the crews water the trees with gaiter bags on them more easily. They will use cad programs to design this tool then we will use our 3D printers to print several prototypes then take them to the crews to test out and get feedback on how we could make it more usable.

There will be these types of innovation opportunities throughout the project for to challenge students to think outside the box and engineer ways to make the tasks easier and more efficient.

