

Student Work Sample
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Honors Environmental Science
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Red Maple: The Beauty of New England



Growth of a Tree

I'm a little maple, oh so small,
In years ahead, I'll grow so tall!
With a lot of water, sun, and air,
I will soon be way up there!

Deep inside the soil my roots are found,
Drinking the water underground.
Water from the roots my trunk receives,
Then my trunk starts making leaves.

As I start to climb in altitude,
Leaves on my branches will make food.
Soon my trunk and branches will grow wide,
And I'll grow more bark outside!

I will be a maple very tall,
Losing my leaves when it is fall.
But when it is spring, new leaves will show.
How do trees grow? Now you know!---

-Meish Goldish



Harvard Forest Introduction:

Over a period of five weeks, my group and I observed two branches on our Red Maple tree. The common name is Red Maple, while the scientific name is *Acer rubrum*. The Red Maple normally begins budding during late winter-early spring. It buds earlier than most other trees during the springtime and it is one of the first to change color during the fall. Because the leaves on the Red Maple bud earlier than other trees, I predict that senescence will occur earlier than other trees. The Red Maple is one of the most widespread trees found in North America and can grow between 60-75 feet tall. The Red Maple is considered a deciduous tree and is best grown in wet areas. We examined the color change of the leaves and when they fell off of the trees, which marks the end of the growing period. My group and I were nicknamed, "The Tree Huggers" and on both branches we observed six different leaves. We calculated the percentage of leaves that were not green on Branch A and Branch B. Each week, my group and I recorded our outdoor observations about the weather, temperature, and how much of the leaves were eaten by insects. Our Honors Environmental science class is learning about phenology, which is the effect that climate is having on the trees, study of the life cycles, and how the leaves are changing due to climate.

My group and I are comparing data from spring to fall 2014, spanning from leaf out to leaf drop. Some of the leaves are dropping earlier because of a combination of chilly days, chilly nights with rainfall, and few sunny days. The climate is changing because of the greenhouse effect and the enhanced greenhouse effect. According to the text, "Enhanced greenhouse effect is when the planet warms at an accelerated rate due to human impact and an increased release of

greenhouse gases, such as CO₂.” The greenhouse effect creates increased temperatures, which enable plants to grow for a longer portion of the year. After collecting the data, I noticed that the leaves on both of my branches fell off by October 29th.

Results: (I put them in the drop box)

Discussion:

On Table 1, the leaves on Tree A fell faster than the leaves on Tree B up until the week of October 14th. On the day of October 14th, 50% of the leaves fell off of Branch A and 17% of the leaves fell off of Branch B. On October 20th, 66% of the leaves fell off of Branch A and 100% of the leaves fell off of Branch B. Although Branch A began to lose more leaves during the first three weeks of the lab, Branch B had leaves that fell off more quickly than Branch A in the later weeks.

In Table 2, I looked at the percentage of the “Tree Not Green” converted in codes from 1-4. During the first two weeks my tree was at 2.00, which means that 26-50% of the tree was not green. From the weeks of October 14th - 29th, my tree was at 4.00, which meant that 76-100% of my tree was not green. On October 20th, there was a Nor’easter, which resulted in leaf loss because of the heavy wind and rainfall. Each time my group and I went to collect data for our Red Maple tree, there was a great variation in weather.

In Table 3, my group and I looked at the start of the growing period (50% leaf emergence Julian Date), which was at 127. The end of the growing period (50% leaf drop 2014 Julian Date)

was Day 289. In order to find the overall 2014 growing period, I subtracted 289-127 to find the amount of days in the 2014 Red Maple tree growth.

In Table 4, I noticed that the Black Oak had the longest growing period of 190 days, while the Black Birch had the shortest growing period of only 147 days. Based on the table, the White Ash's 2014 growing period has not concluded. These three groups separate Black Birch trees, while my group was the only one that examined the Red Maple.

On Graph 1, I noticed that from Julian Day 287-293, there was a high percentage of the number of leaves that fell off Branch A and Branch B at 50%. Between days 272- 281, there was not much of an increase in the graph during those few days. Between days 293-302, the percentage of leaves that fell off both of the branches was not as high at 17%.

On Graph 2, it was constant from Days 272-281. Then there was an increase in the graph between the days of 281-287. Spanning from days 287-302, the graph depicted that the tree was not green.

Conclusion:

After reviewing the results of the other trees in my Honors Environmental Science class, I came to the realization that the Red Maple tree does not have the longest growing period. Based on the results in the table, I concluded that one of the Black Oak trees, one of the Black Birch trees and one of the Black Cherry trees began their growing period on the same day as the Red Maple tree. The tree with the longest growing period is the Black Oak tree, while the tree with

the shortest growing period is the Black Birch. The Shagbark Hickory has the earliest **beginning of the** growing period. Although the Red Maple tree is one of the trees that flowers earlier than most trees, it does not have the longest growing season. I predict that the Red Maple tree's growing period varies depending on the climate in the fall and in the winter. I think that if there is a rainy spring, the leaves will begin to bud earlier verses when there is a dry spring. There are some modifications that I would make to the project. I think that students should upload information onto a class discussion board on the portal. Everyone would be able to share information with one another about various tree growths, leaf fall, weather notes and observations. Next year, I think that students should find a way to use the excel document on the iPads because there were many technological difficulties with the computers. **Thank you, very constructive ideas! Overall – predict longer growing periods for maple in the future....**

Works Cited:

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