Harvard Forest Schoolyard Ecology

Buds, Leaves and Global Warming

in an 8th grade classroom

State Curriculum Frameworks

- General Inquiry and Experimentation standards
- Middle School: Life Science #17: Identify ways in which ecosystems have changes throughout geological time in response to…human impact.

State Curriculum Frameworks

- Can be tied into:
  - Producer/Consumer relationships
  - Food Webs
  - Carbon Cycle
  - Function of Cells
  - Chemistry of Life

My Curriculum Outline

- September: 4 days to intro **Global Warming and current research**; 2 days to learn protocol and get data collection started
- Fall: 15-20 min 1x/week for 4-8 weeks
- March/April: 2 days to review protocol and get spring tree data collection started
  2-5 days for **human impact on ecology** (carbon footprint, pollution, waste, sustainability)
- Spring: 15-20 min 1x/week for 4-8 weeks
- End of May: 1 week for **Data Analysis for Science Fair**

Directions to Go In

- Carbon Storage and Carbon Cycle
- Seasonal Life Cycles
- Cell Cycle
- Photosynthesis and seasonal cycles of oxygen/CO_2 levels
- Climate and Weather
- Global Climate Change Research

Work on My End

- Fall Set Up: tag branches and leaves, make groups, assign branches, identify species
- Keep all data organized
- November/December: input data (or have students do it); submit by Jan 1st
- Spring Set Up: check branches, label end of 6 buds
- End of May: input data (or have students do it); submit by June 1st

Challenges & Rewards

- It matters if they get it!
- Remembering the Big Picture
- Student behavior
- Volume of data and time required (for buds/leaves)
- Time (fitting it in)
- Student engagement
- Student enthusiasm
- Working with real numbers and seeing change over the years
- Real science without known answers
- Being outside

Student Reflections

“I like going outside because we can get some fresh air and look at the trees. It makes me feel like an explorer. It also gets us moving instead of sitting down for an hour.” MC

“ We learn a lot about how the leaves change or when they fall off. I like going outside too. I also liked this tree that we discovered. It smelt like Froot Loops! I can’t wait to see how our branches are going to look when we get back outside at the end of March.” MG

Student Reflections

"I liked have a group, being outside, and I feel like we have out own little tree. It's really fun. I also like observing the tree and learning more about trees and all they do for us." FM

"It is cool to learn about different kinds of trees and see which kind lose their leaves first and which kinds will sprout first." NR

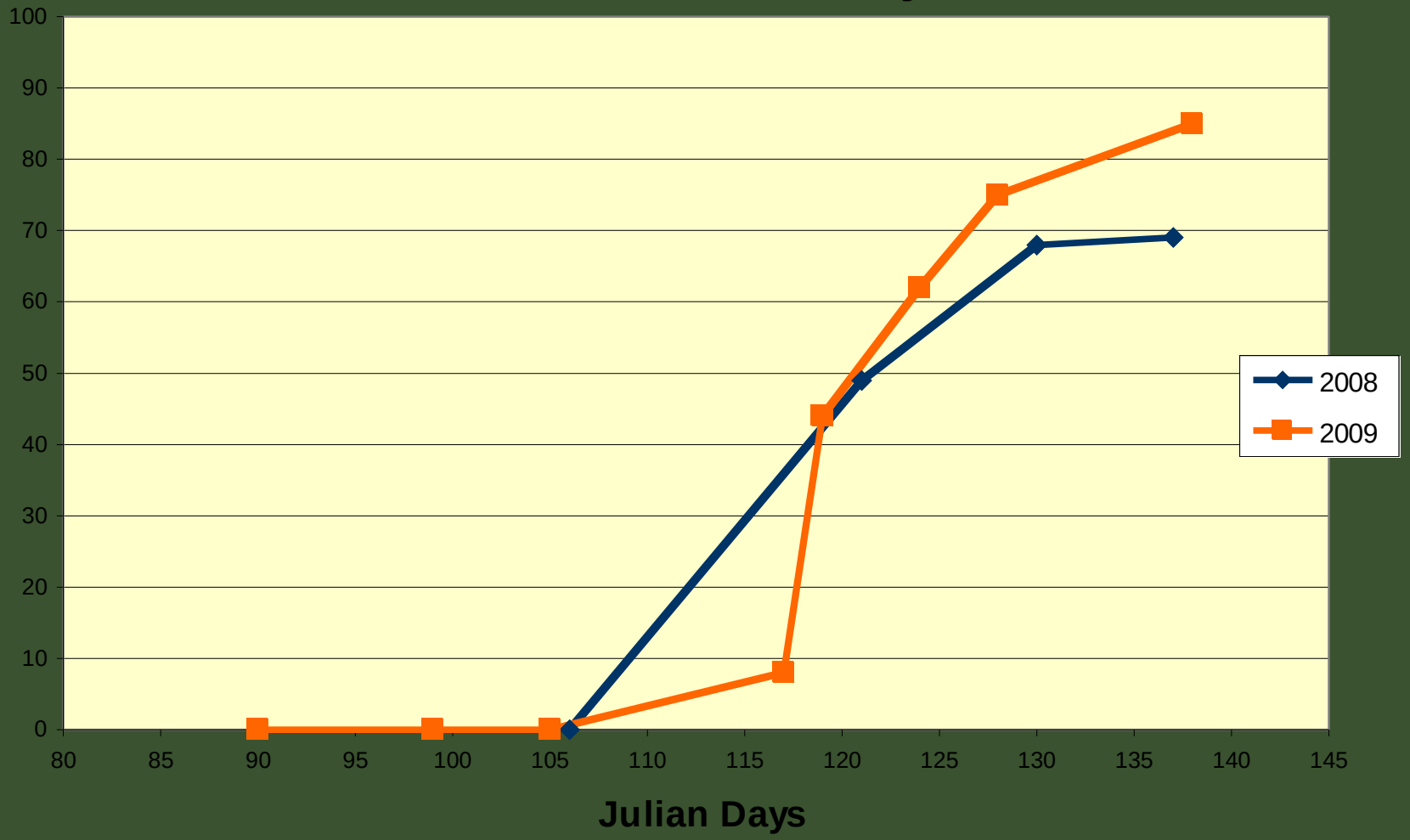
"I like the tree project because we are conducting a new scientific study. It's also a chance to get out and enjoy the fresh air." JK

Student Reflections

"I like doing the tree project with Mrs. Greene because it teaches me about nature and the cycles the trees go through. I also like acting like a scientist in examining the trees and going outside." ML

"I think it's a great project because you get a better understanding of what's going on. For me I think students will learn and remember the facts of the tree project instead of just reading it out of the science book." CH

Percent of Total Buds Burst (Spring) for WSMS Schoolyard




May
June
PREP
Tree #8
Tree #9
Tree #10
Tree #13
Methods
Results
TREES!


Tree #4
Methods
Study Area
Introduction
Hypothesis
Results
Summary
Tree #5
Introduction
Branch Maps
Study Area
Methods
Summary
Summary
Tree #6
Branch Map
Methods
Tree #7
Branch Maps
Introduction
Summary

The students who studied Branch B were:
Zach
Vasily
Lois
Kelly

The students who studied Branch A were:
Maddy
Emily H.
Jess
Brianna

BLACK BIRCH

Tree #9

The students who studied Branch B were:
Anthony
Will
Jon

METHODS

The methods of tree 9 are we observed, we measured and, we wrote down our observations. First, we went outside and we identified our tree. Then, we took tape and we taped 6 branches numbering them 1-6. After that, we were able to start observing. What did we observe? We observed how the leaves changed over time, the color etc; our reasoning for this was to see when the buds blossomed and when the leaves changed. We measured how much the leaves changed in the fall. In the spring we observed when the buds blossomed. The observations that we made, we wrote down on our data sheet. This data sheet collected once a week is sent to the scientists that started this program. They collect all the information we sent them plus their own observations they made.

INTRODUCTION

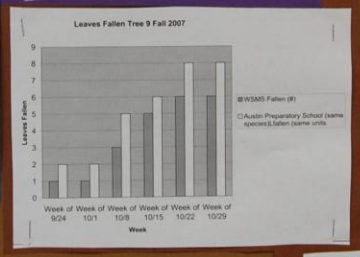
For the last few months we had to do a research project. This project involved us collecting tree data for Harvard forest. We had a black birch tree that we observed and recorded the difference over time between seasons past of the bud and leaves of the tree. In the fall we recorded when the trees leaves would change its color and fall. Yet, in the spring we would record the data for when the buds on the branches would blossom and how far the new leaves would come out of the bud. Not only is this a project in witch we can learn about the changes of the seasons and learn to record and study the data we have found, but we give this data to Harvard forest and they can use it for more valuable research with other schools around the United States, even Canada. So as you can tell, we are doing some really valuable research that could come in handy for the future.

BRANCH MAPS

RESULTS

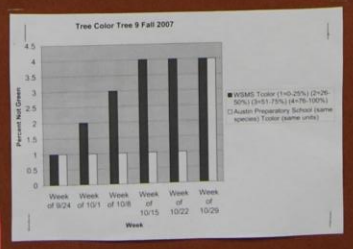
STUDY AREA

My tree, # 9 is outside behind the school. It is in the woods next to the drainage ditch that is near the soccer field that is located on the right side of the school, if you are facing the front.



Data Analysis

Our 2007 growing season ended on the week of October 8th. The growing season ends when half of the tree is not green. Our 2008 growing season started on the week of April 28th. The growing season begins when more than half of the tree is green.



SUMMARY

The project that our class is experimenting at the West Springfield Middle School has been collecting data on tree's leaves. We discovered the type of leaves, and the color. We also discovered how long it takes a leaf to fall, and the bud to burst. Our data will be sent to Harvard Forest (a small research

RESULTS


GENETICS
February
March
ECOLOGY
April
ECOLOGY
May
Summary
Tree #6
Branch Map
Tree #7
Introduction
Methods
ReSuLtS
Tree #8
Tree #9
METHODS
INTRODUCTION
BRANCH MAPS
2007-09-26
2007-10-12