

Team 8-2 Science Fair 2009: Buds, Leaves and Climate Change

Our science fair is a little different than a typical science fair. You have been acting as citizen scientists during this school year as we observed and recorded information on the length of the growing season in our schoolyard. It is now time to analyze our data and present it to the community. During the next week or so we will spend class time preparing for this.

Anatomy of a Scientific Poster:

Professors, researchers, and professional scientists often make posters to display and communicate their research. But these are not your average middle school posters. They are big, full color, and printed on a giant printer. We can't do that, but we can put the same type of information on ours. Their posters include:

- Introduction
- Description of Study Area
- Methods (the steps taken to conduct the research)
- Results (usually graphs or tables)
- Analysis of Results
- Conclusion
- Summary

Our Posters:

Each of our five science classes are split into 6 groups and each group studies one branch, so we study 30 branches, or 15 trees (since there are 2 branches per tree). It does not make sense for every student to make their own poster, but it also doesn't make sense to try to get 108 students to work on one poster together. So we are going to make 15 posters, one per tree, and each group will be responsible for 1/2 the poster (since there are 2 branches on every tree). This is how it will be split up:

Groups with Branch A:

- Branch Map (shows your buds/leaves and other leaves/shape/offshoots)
- Introduction (for poster)
- Study Area Description and Map
- Methods (what we did)
- Spring Data Graphs (branch activity and comparison to other schools)
- Timeline (leaves marking big changes)

Group with Branch B:

- Branch Map (shows your buds/leaves and other leaves/shape/offshoots)
- Data Analysis (how long was the dormant season? what do the numbers mean?)
- Fall Data Graphs (branch activity and comparison to other schools)
- Summary
- Headings (for the board)

Back On Up

It is important that you remember why we are doing this project before we put much time into our data and preparing for the science fair.

What is our short-term scientific question?

What is our long-term scientific question?

Who do we partner with on this project?

What have you done all year to contribute to this scientific investigation?

Dealing with the Data:

The data has been compiled per tree, so you do not have data for just your branch. The only information on your data sheet that gets entered into the spreadsheet is the Total # of Leaves Fallen/Buds Burst. So this is what you will be graphing.

To show how many leaves were fallen or buds were burst as time progressed, what kind of graph would you use?

Independent Variable (you change): _____

Dependant Variable (responding to your change): _____

→ Julian Days – the number day in the year (out of 365)

Draw a sample sketch of how you would set up a graph of the fall data.

NOTE: We will also be compiling all the data for the whole school yard and graph that as well.

Analyzing the Data:

After we understand and communicate what we found, we need to compare your results to last year's data (and maybe another school if we have time).

Each tree's data will be graphed and from that graph we can find the end and beginning of the growing season this year, which is our ultimate goal. Each group will calculate one of these dates (beginning or end) for your tree, and then we will also calculate the end and beginning dates for the (averaged) growing season of the entire schoolyard.

Conclusion:

We will only be able to answer our short-term question at this point. We will draw a conclusion for each tree and for the schoolyard as a whole.

Components of a Scientific Poster Cheat Sheet

Introduction

Includes the following information:

- Purpose of study (why do we do this?)
- Describe the link with Harvard Forest (Dr. O'Keefe's study)
- Short-term Question: When does the growing season end and begin?
- Long-term Question: Is climate change (increased CO₂ in the atmosphere) changing when the seasons change (growing season ends and begins)?

Study Area Description

- Describe the location (proximity to school, roads, and houses)
- Describe geographical location (state, climate, ecosystem, terrain, forest)

Methods

Using the protocol sheets provided by Harvard Forest, describe the general steps we took (in the fall and the spring) to collect our data. Include how many branches were studied, how many buds/leaves on each branch, when data was collected, what data was collected, how often data was collected, etc.

Data Graphs

Spring: calculate the values for the

- % buds burst on your tree (for each data collection day)
- Julian days

Fall: calculate the values for the

- % leaves fallen off your tree (for each data collection day)
- Julian days

Using your knowledge of variables and graphs, communicate your data through graphing to show how the number of leaves fallen or buds burst changed over time.

Data Analysis (Conclusion)

Using your data, interpret the information to answer your short term question. Remember, the growing season ended when half the leaves had fallen and began when half your buds were burst.

Explain briefly

- how you analyzed the data
- what it means (conclusion to the short-term question)
- how this relates to the long term question we are still working towards

Summary

Summarize everything stated on the poster. Briefly state:

- the question and purpose of the study
- what you spent the year doing
- what type of data you collected
- how we analyzed the data
- what was our conclusion to the short-term question
- what is the next step in future years

Timeline

We will be constructing a timeline to show when each tree (indicating tree species) lost its leaves in the fall and burst in the spring. Once the Julian days are calculated, we will make a timeline to show the date that your tree ended and began its growing season (half leaves fallen and half buds burst).

You will be constructing this timeline around the room, cutting out leaves that represent the shape of your tree species' leaves and placing those markers on the timeline at the date of half leaves fallen or buds burst.

WSMS Fall Data Tree 15 (Trembling Aspen)

