



No "Blue" Students - How About Blue Skies?

Midway Meteorologists ~ Fifth Grade



Introduction:

On September 7, 2012, a huge hailstorm came through Midway. The Weather Channel did not predict this storm and there was a lot of damage. Midway Meteorologists decided that we wanted to create a local source for weather data, so we could be prepared for storms. This project allows us to stay up to date with the current weather through the use of a weather station. We also released a weather balloon to see if the weather behaved the same at higher altitudes.

We wondered:

- How would weather information from the Midway area compare to Columbia weather reporting devices?
- How does water vapor and wind speed affect a weather balloon?

We used information from our weather station instruments and data gathered from our weather balloon to answer our questions.

Methods:

1. We did research on what kind of weather instruments we would need to gather data about Midway area weather.
2. We talked to an expert, Eric Aldrich, from KOMU News to learn about weather data collection and forecasting.
3. We set up a weather station at our school and began collecting information about temperature, rain, wind speed and barometric pressure at four data points daily.
4. We released a weather balloon on April 9th with a GPS tracking system.

Our weather station consisted of:

- A barometer to measure the atmospheric pressure. If the pressure is high, then the weather should be sunny and if the pressure is low, the weather is cloudy or stormy.
- A thermometer to measure temperature.
- An anemometer to measure the wind speed.
- A rain gauge to measure precipitation.
- A weather vane to measure wind direction.
- A wireless console to collect the data and relay information to the classroom.



Our weather balloon consisted of:

- A balloon filled with helium.
- A video camera to capture the trip.
- A phone to track the flight of the balloon.
- A Styrofoam ball to house the equipment.
- A hand warmer to keep the equipment from freezing.
- A parachute to slow the falling of the equipment.
- Dr. Market, Eric Aldrich, and some student helpers.



Location of Weather Instruments

Image 1



Image 1: This is an image from the website for the Vantage Pro2 Weather Station to which we have added identifiers. This shows what our barometer, weather vane, anemometer, rain gauge and thermometer look like.

Our weather balloon was released on April 9th at 9:00 AM from the field shown in our aerial photo. We were able to get preliminary reports as to where it came back down; between Macon and Shelbina, Missouri.

Results:

Figure 1

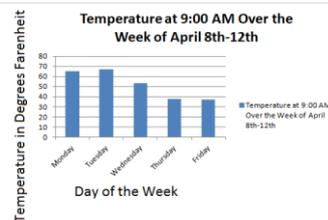


Fig 1: This graph shows the temperature we took with our weather station over one week at 9 AM. This shows how the temperature can change when a cold front moves through Midway.

Figure 2

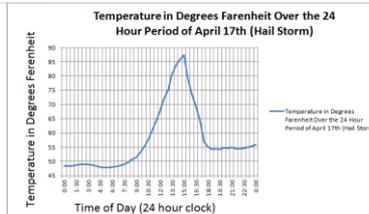


Fig 2: This graph shows the temperature over the 24 hour period during the hailstorm. This shows what the weather pattern probably was similar to during the September 7th hailstorm.

Learning about Anemometers



Figure 3

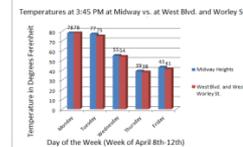


Fig 3: This graph shows the temperature differences between Midway and West Blvd. Elementary School in Columbia.



April 9, 2013 balloon launch

Image 2



Image 2: The red dot represents Columbia and the red circle represents the probable location of our weather balloon, according to Virgin Mobile. It traveled approximately 60 miles in three and a half hours!

Conclusion:

We used our weather station to look at temperature, wind speed, rain amount, and barometric pressure every day at four time points: 9:00 AM, 10:40 AM, 12: 50 PM, and 3:45 PM. When we compared the data, we see the specific data that comes with a stormy day, a sunny day, and a day with a cold or warm front moving through. We looked at our data vs. another site in Columbia and we saw that there were differences. This showed us that our weather station was worth it! We also experienced another hailstorm here on April 17th. Now we can see what the weather does during a hailstorm like the one that caused us to ask for the weather station!

Also, because the ground wind speed at the time of our weather balloon launch was 10 mph, and our balloon traveled 60 miles in 3 ½ hours, we found out that our balloon traveled at a speed of 17.1 mph. We proved that our weather balloon traveled farther at higher altitude.

Acknowledgments:

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