

WeatherBug Achieve Connections

January 6, 2005

11th Edition

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WeatherBug Achieve will take you to Punxsutawney, Pennsylvania for the annual Groundhog Day celebration on February 2, 2005. There will be a Groundhog Day link in the Activities section of Achieve. Plan to spend some time on winter related activities with Achieve! I'll tell you more about it in the next edition of Connections.

In future editions, we will alternate the Weather Events and Members Spotlight. We are also discontinuing the In the News section. We hope that this will make Connections smaller in size and easier to download while providing better content for you to use in your classroom.

Classroom Ideas

How do you measure snow? Does the tracking station rain gauge record snowfall?

These are questions we get every year at this time. To answer the second question first, no your rain gauge does not record snowfall. You may from time to time get some recording of precipitation from melting snow captured in the gauge. It is not an accurate measurement of precipitation from snow.

So how do you measure snowfall?

The tried and true method and one used by the National Weather Service is to measure the depth of snowfall using a hand-held, calibrated instrument commonly called a ruler. There are a couple of rules that you need to follow. Because snow melts or can be blown around, measure the snowfall in an odd number of areas and take the average. This helps to give a better idea of the amount of snow that fell. You will also want to remember that snow falls on top of grass leaving pockets of air between blades so that the snow does not actually reach the ground. So inserting the ruler to ground level will give you an exaggerated snowfall measurement if there is a lot of grass at the location.

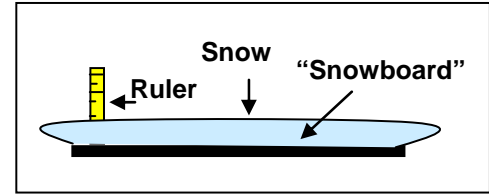


*Let it snow, let it snow, let it snow
Wilson, NC 12/26/2004
From Your Photos*

For a better assessment of snowfall amounts, a snowboard is a great tool. Not the kind you schuss down the slopes on but one you can easily construct at home or in your classroom.

Building a Snowboard

Take a wooden board about 18 inches wide and 2 feet long. Paint the board with several coats of high gloss light (white is preferable) colored paint so that it is very smooth and shiny. Place the “snowboard” flat on the ground in an area away from buildings and trees where snow is most likely to accumulate. Be sure to mark its location with something that rises above the ground several inches so that you can find it in deep snow – like a small flag.



Snowboard Design

During a snowfall event, use a ruler to measure the amount of snow in inches or centimeters that has accumulated on the “snowboard”. Then remove that accumulated snow and start over again (just brush it off!) Repeat this process every hour during the snow event. You will have hourly snow readings and a relatively accurate cumulative reading for the event.

This can be a great activity for those of us who live where it snows and can get outdoors.

The next step is to determine how much liquid precipitation the snow represents. It makes a great math lesson. Every hour that you record snow accumulation, you should also record the outdoor temperature and notes about the change in temperature during the previous hour. Then use the table below to determine the amount of water in the snow that fell for each hour. You can then calculate the approximate liquid precipitation per hour, total for the time period measured and also the average hourly precipitation during the day. It makes practicing math skills like addition and division a lot more fun!

If you cannot construct a snowboard, wooden decks or platforms and grassy surfaces will still be good choices. Have fun and let us know how your “snowboarding” works.

Temperature	Snowfall and Water	Ratio
35 F	7” of snow will melt into 1” of water	7:1
29 – 34 F	10” of snow will melt into 1” of water	10:1
20 – 28 F	15” of snow will melt into 1” of water	15:1
10 – 19 F	20” of snow will melt into 1” of water	20:1
0 -9 F	30” of snow will melt into 1” of water	30:1
< 0 F	40” of snow will melt into 1” of water	40:1

From NOAA Resource

Share your experiences! Send your stories to classroomfeedback@aws.com and don't forget to upload your photos in the Upload Photos link in the Community section.

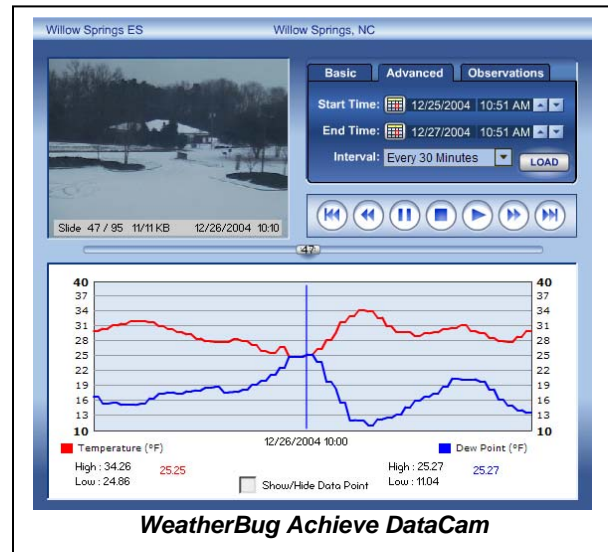
Weather Events

When a weather event occurs, investigate the why and how.

It was very frustrating for travelers this holiday season who were inconvenienced by the weather. So let's look at one event that tied up folks traveling north and south by car along the southeast coast on Sunday, December 26th. Use the WeatherBug DataCam tool and the settings in the table.

Station	Willow Spring, NC 27592
From Date	12/25/04 12 AM
To Date	12/27/04 6 AM
Interval	Every 30 Minutes
Observation 1	Outdoor Temperature
Observation 2	Dew Point

From the graph, we see that the dew point was rising while the temperature dropped slightly. If we view the time-lapse, we see that around 7:00 AM snow has already accumulated on the rooftop in the background. The dew point and outdoor temperature are still 4 degrees apart but close enough to produce precipitation. If we change the observations to look at temperature and relative humidity, we see that the RH rose 20% from 7:40 AM to 8:10 AM when the dew point and outdoor temperature were identical. This situation with temperatures below 32°F assures snow in most cases which is verified in the images. Around 11:30 AM the dew point dropped and the outdoor temperature began to rise putting an end to the snow event. Now change the observations to show temperature with wind speed and direction. The wind direction changed from NNE to NW.



But what caused the rise and fall of the dew point which was the precipitator of the snow event? The air across North Carolina was very dry in advance of the storm moving off the southeast coast, with a dew point in the teens. Snow from the storm began falling after midnight on the 26th, but evaporated before it could reach the ground. This evaporation, along with onshore northeast winds, helped to moisten the air near the ground, and caused the dew point to steadily rise. Eventually, the air was moist enough that snow reached the ground and accumulated. The storm was fast-moving, so by midday on the 26th, winds shifted to a northwest (offshore) direction bringing in drier air. This caused the snow to end and allowed the dew point to fall back to where it was before the storm.

Let us know about interesting weather events that you find on the WeatherBug network. Provide a table like the one above and include a short paragraph about weather at the site. Send Interesting Weather to classroomfeedback@aws.com and type Interesting Weather in the subject line.

Cool Cams

Lundy ES 89124
Mount Charleston, NV
Elevation 7,770 feet



This camera is located in the mountains of southern Nevada, 28 miles northwest of Las Vegas. This wooded area is a paradise for hikers with over 53 miles of hiking trails in the immediate vicinity. You'll find a typical desert climate with the yearly maximum temperature averaging around 80 degrees. Annual rainfall totals to around 4".

Clark Planetarium
Salt Lake City, UT 84101
Elevation 4,390 feet



From this camera, you can see the skyscrapers of downtown Salt Lake City as well as the foothills of the Wasatch Mountains. Clouds often form over the mountains due to orographic lift (moist air moving over rising terrain) and then drift eastward toward Salt Lake City producing scattered showers and thunderstorms.

In the next edition of Connections:

Find out how you and your students can participate with Achieve in the Groundhog Day in Punxsutawney with WeatherBug Achieve and create your own Groundhog Day prediction for your area.