Blogging About the Weather

Take forecasting to the next level by having students present their weather predictions online.

By Kyle Evans and Wendy Frazier

After a few years of teaching weather concepts to fourth graders, we could no longer ignore that our students were missing something. The looks on their faces at the end of the weather unit said it all: We needed to do something to spark their interest and make this unit more meaningful to them. Since a majority of the content standards related to weather focus on forecasting, our students historically have spent time studying cloud types, fronts, storms, and using a barometer to read air pressure. Although this allowed students to "do" science, we wanted to enhance student interest and create purpose for their learning. We came up with a great idea—allowing students to create their own weather forecasts and present them to their classmates on a blog. With this goal, students were eager to learn how to read a barometer and thermometer, classify clouds, and form a weather forecast based on data they collected. In addition, technology engaged students as they recorded and uploaded their forecasts.

Introducing the Unit

The unit began with students receiving a letter that they had been hired to be our school's weather forecasters (see NSTA Connection). The letter explained that they would need to use the science knowledge and skills they would be learning in the weather unit to create a weather blog—with the best entries to be shared with the entire

school. At this point, the students were already familiar with blogging. Throughout the school year we used our "Adventures in 4th Grade" blog (see Internet Resources) for other subject areas. Here the students usually responded to some sort of activity for social studies or literature.

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www.scilinks.org
Enter code: SC041001

Weather Instruments

First, students participated in a refresher course on weather instruments. Students spend a lot of time in lower elementary grades learning about simple weather instruments such as thermometers and rain gauges and their function, so we began with a review of these. We then segued to an introduction of more complex weather instruments, such as the barometer, which led into our lesson on air pressure. With the topic of air pressure, it is important to provide students with concrete experiences (see NSTA Connection for examples). We went on to discuss how air pressure affects weather, in particular what rising, falling, and stable air pressure means for the coming weather.

Cloud Classification

Next, the class moved on to a study of clouds. We focused on four main types of clouds (cirrus, stratus, cumulus, cumulonimbus) and the weather associated with the formation of these particular clouds. We had a discussion about the types of weather the students had experienced and what the sky looked like at the time of that weather. Once that information was recorded on a class chart, we delved further into the types of clouds. The website "Web Weather for Kids" (see Internet Resources) was useful for helping students visualize what different types of clouds look like.

Weather Fronts

To provide a context for a discussion on weather fronts, students observed various online and print weather maps depicting weather fronts (see Internet Resources). For each map provided, students recorded in their notebooks what they were able to learn from the map and any questions they had about symbols and terminology. In a class meeting, students shared what they learned from each map, along with their questions. Using the map, students identified the different types of fronts found throughout the United States on a given day. We checked for the type of weather associated with the front found on the map to see whether it matched with the information we had already discussed. A discussion occurred and student questions were answered either by the teacher or other students. If answers from other students contained misconceptions, these were addressed by the teacher for clarification.

Next, the students proceeded to their class blog to watch a short video dealing with fronts (see Internet Resources). This video provided students with information about what a *front* is, how symbols are used to depict a front on a weather map, different types of fronts, and the weather that is usually associated with different types of fronts. Based on the video, the students were assigned one of four questions to answer on the blog using a *jigsaw activity* format. Jigsaw is a cooperative learning strategy in which each student in a group is assigned a different topic in which to become an expert. Students studying the same topic form topic-specific groups to work in while they become experts. Once experts are satisfied they have learned what they need to about their particular topic, then they leave their study group to go back to their original group. In their original groups, each expert shares her/his information so that the entire group develops a basic understanding of the different topics in which their group members are experts. Students dispersed into expert groups to study:

1. How does a cold front occur?
2. How does a warm front occur?
3. What types of clouds are found when you have a warm front?
4. What type of weather occurs when an area is experiencing a cold front?

Figure 1.

Prompts for storm study.

You will become an expert on a type of storm by researching information on the following:

1. What causes this type of storm? Include in your explanation temperature, air pressure (front), wind, and rain.
2. What are the physical conditions of this storm in terms of wind strength, rain amount, pressure level, and damage caused.
3. Identify examples of how this type of storm has influenced history. Be sure to include year of storm, storm's location, storm's name, storm's strength, and storm's affect on civilization.
4. How is the strength of this storm measured with weather technology?
5. How has our ability to measure the strength of this type of storm changed over time?
6. How is the movement of this type of storm tracked with technology?
7. How has our ability to track this type of storm changed over time?
8. What other information do you feel is useful to know about this type of storm?

To complete the jigsaw, students were regrouped to share the posted answers for all of the questions. Following the jigsaw format, each group had one person that was an expert on each question. As an application of what they had learned, students posted a comment to a question that the teacher posted on their blog: "There is an area of low pressure, what does that mean for the weather?"

Last, students revisited their class list of unknown symbols and terms in pairs and as a class to ensure that all unknown symbols and terms were now readily identified in their science notebooks.

Storm Experts

Our last topic was storms—in particular, thunderstorms, hurricanes, and tornadoes—focusing on how they occur and the weather conditions associated with each. To keep instruction "fresh," students were divided into new groups of three because we find that different student combinations energizes students as they experience the novelty of working in a new group. Each student within a group was assigned to become an "expert" on a different type of storm. The students used various books and internet links to research these types of storms. They documented their findings in their science notebooks using a set of prompts that guided students' research into the causes, physical conditions, and historical records of each type of storm along with other information they felt useful to their understanding. See Figure 1 for a list of prompts. Prompts were structured so that they supported students' recognition of different types of storms based on their physical characteristics. Prompts also gave them a basic understanding of how these storms arise, exist, and eventually dissipate. Students documented historical occurrences of the different storm types to better understand the effect of these storms on civilization while learning how human's ability to track and measure the strength of storms has improved over time with advancing technology. Once each student had completed their set of prompts, each student expert shared information with the rest of the group so that all members would have information on the storm types in their science notebooks. Content was assessed by fellow group members as the teacher circulated around the classroom also checking for accuracy. Periodically, the teacher asked an expert from one group to compare their notes with those of another group's expert in the same area. In addition, student notebooks were reviewed by the teacher after class for content accuracy. If erroneous material was identified in the student notebooks, then it was addressed during the following lesson with a particular group or with the entire class as needed. An organizational chart was posted in the classroom that identified who was an expert on each storm type so that students would know who to seek if further information on a particular type of storm was needed.

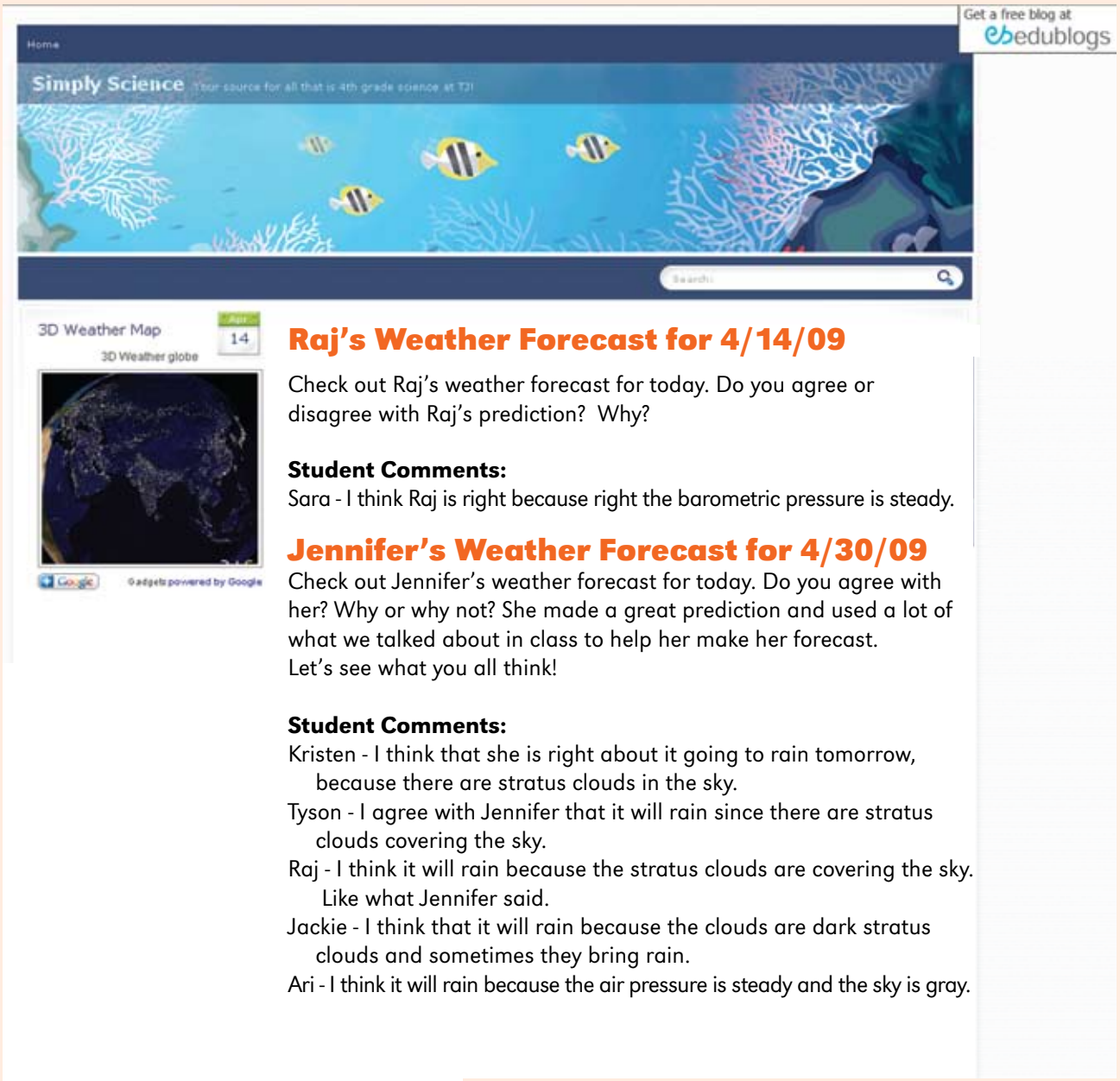
Create a Forecast

Before we began forecasting, we revisited the letter students received and provided students with a template and scoring guide to help them create a script for their weather forecast (see NSTA Connection). Prior to lunchtime, students collected data throughout the day—focusing on temperature, current weather conditions, cloud types, and barometric pressure. After students had collected their data, they were ready to make their forecast for the remainder of that day and the next day.

The students were taught how to use the software and the headset to record their forecast. They were also shown how to maximize the quality of their video by maintaining an appropriate position in front of the camera and speaking clearly. Students were then instructed in how to play back their video and rerecord as necessary. Finally, they were shown how to save their file. In our case, the teacher needed to do the file uploading because he had higher-level access to the blog to create/edit posts, whereas the students only had the ability to post comments. The Edublogs website

Figure 2.

Examples of blog entries with comments.



(see Internet Resources) can be used to host the class blog, or your district may be able to host your blog on its server. Be sure to check with your school district's guidelines for blogging and procedures for how to post blog entries. If available, your school's technology specialist can also serve as a resource. See Figure 2, p. 27 for examples of students' posted forecasts and stay tuned to *http://wackyaboutweather.edublogs.org* for future postings.

Sharing Forecasts

After the student weather forecasters uploaded their predictions, their classmates commented on the post about whether they agreed with the forecast and why based on their own scientific knowledge (see NSTA Connection for guidelines and scoring guide). Students were encouraged to clearly state the knowledge that caused them to disagree with the forecast. If time allows, students should comment on each of their classmates' entries, so that all students are involved with each forecast entry. They will either be a forecaster or be responsible for making a comment every time. If instructional time is more limited, then students should have an opportunity to comment on at least one peer's forecast.

Based on the classmate reflections, the class selected one to two forecast entries that were shared with the entire school during final announcements. To do this, the teacher can e-mail fellow teachers the link to particular blog entries so they can share the forecast with their students by either reading a blog entry aloud or displaying it on their computer projector if they have one.

As an extension, fellow teachers from other grade levels can be encouraged to e-mail the class a response to the forecast they received, which is a great opportunity for students to learn about the nature of science and its relationship with technology—especially when the forecast does not come to fruition. As a class, we discussed the precision that is required for developing and using weather instruments, the extent to which we made accurate predictions based on prior data, the limitations of the weather instruments we used, the limited length of time over which data were collected, our limited yet growing understanding of weather-related science concepts, and other potential threats to the validity of our forecasting. Students can also discuss potential ways to fix these problems in the future so that forecasts are more accurate. Throughout the year, students can continue to make forecasts that incorporate these suggested improvements as instructional time permits.

Conclusion

We found this combination of blogging and weather forecasting an innovative way to assess students' mastery of weather-related content. We saw a notable increase in students' enthusiasm for science learning. By giving students a reason for learning, they were more motivated to learn weather concepts and the skills associated with the use of weather instruments. In addition, students' responsibility for learning was increased by having them comment on each others' forecasts and use comments received to improve their weather-forecasting protocol. ■

Kyle Evans (evansk@fccps.org) *is a fourth-grade teacher at Thomas Jefferson Elementary School in Falls Church, Virginia. Wendy Frazier* (wfrazier@gmu.edu) *is a professor in the College of Education and Human Development at George Mason University in Fairfax, Virginia.*

Internet Resources

Adventures in 4th Grade
http://evansburg.edublogs.org

Atmosphere: Weather Fronts
http://videos.howstuffworks.com/hsw/5670-atmosphere-weather-fronts-video.htm

Edublogs
http://edublogs.org

It's a Breeze
http://kids.earth.nasa.gov/archive/air_pressure

Simply Science
http://wackyaboutweather.edublogs.org

U.S. Frontal Maps
www.weatherforyou.com/maps/us_fronts.html

Web Weather for Kids
http://eo.ucar.edu/webweather

NSTA Connection

Download the letter introducing the unit, the unit timeline, a list of air pressure activities, forecast scripts, guidelines for comments, and rubrics at *www.nsta.org/SC1004.*

Connecting to the Standards

This article relates to the following *National Science Education Standards* (NRC 1996):

Content Standards

Grades K–4

Standard A: Science as Inquiry
- Abilities necessary to do scientific inquiry
- Understanding about scientific inquiry

Standard D: Earth and Space Science
- Changes in Earth and sky

Standard E: Science and Technology
- Understanding about science and technology

National Research Council (NRC). 1996. *National science education standards*. Washington, DC: National Academies Press.