24 hour Temperature Cycle – Implementing a Model Lesson Plan

In this lesson, students will analyze through comparing and contrasting the idea of energy transfer, the Law of Conservation of Energy, and its relationship to the temperature of given locales over a 24-hour period. Additionally, they should be able to determine the temperature differences in the 12-month cyclicity of the seasons. The students will compare and contrast the diurnal temperature variations in Lansing, MI; Akron, OH; Los Angeles, CA; and Dallas, TX using information provided by climatzone.com. In addition, they will use a rotating earth simulation to aid in their decisions.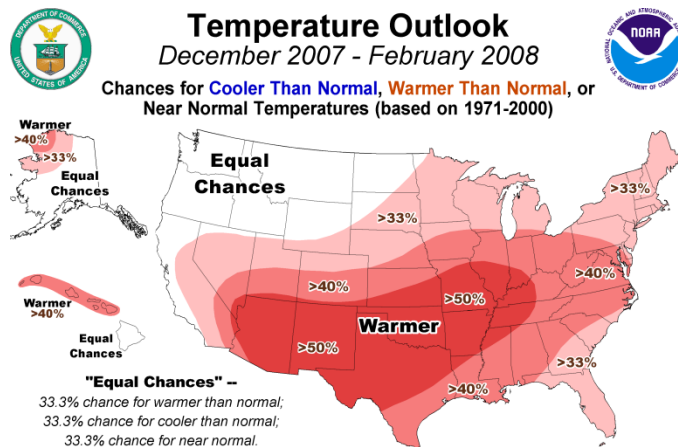 The students will further compare the weather patterns of each location with one another and begin to extrapolate the weather for the upcoming winter season. Students have the use of a laptop-cart containing twenty laptop computers with internet access. I separated the students were separated into groups of two and asked to complete the Student Handout for the Model Lesson Plan.

Image provided by National Oceanic and Atmospheric Administration (NOAA).
http://www.noaanews.noaa.gov/stories2007/images/20071009-temperature-high.png

This lesson coincided perfectly with the sections currently studied by the students. Up to this point, students have learned from sections covering Matter and Energy; specifically they have learned the Kinetic Theory of Matter, Conservation of Energy, and the different states of matter with changing volumes, pressure, and temperatures. Currently, the students are covering a section on Energy, Heat, and Temperature, specifically energy transfer and the concept of Specific Heat. I asked the students to use the tools they have gained from their book studies to complete the 24 hour Temperature Cycle lesson.

In the application of this lesson plan, students were able to not only use data from Climate-Zone, but they were asked to compare this data with that provided by NOAA and The Weather Channel. This lesson excited the students by the idea that they could apply the text-based material they have been learning with data provided through these sites. The students enjoyed their assignment, almost treating it as a quest for information. In fact, those students that finished early on the second day were encouraged to think of the location of their upcoming winter vacation and determine what the weather will be like based upon the weather provided for prior years. Additionally, I asked these students, especially those with vacations planned in the

Southern Hemisphere, to discuss the reasons for the weather they will encounter in December. This lesson virtually allowed the students to become novice meteorologists, several of which have aspirations of becoming television weather forecasters.

Unfortunately, though a majority of students enjoyed the assignment; several students expressed the lack of desire in viewing and predicting weather patterns. As a result, I asked these students to refine their search to websites that could contribute useful data to their classmates' quest. An additional problem encountered through this lesson, though mild by nature, was the focus of students. Upon reflection of this assignment, I have realized that our server filter needs to be stricter with the sites the students access during this time. This realization came about because 8th grade students in front of a laptop with internet access naturally gravitate to their favorite social-networking site, emails, or chat-windows to communicate with students in other classes. Though this is a minor problem, many students need refocused on the lesson.

I do not believe this assignment would be as easy to accomplish without the use of technology, most notably reliable computers with high-speed internet access. The students would not have been able to accomplish as many tasks and make educated predictions if they had to look-up the information in a text, almanac, or encyclopedia. The problems implementing this lesson without the use of technology seem endless; I cannot imagine the time and effort necessary on the parts of the student and educator in order to complete this lesson.

If I taught this lesson again, I would certainly check the server filter; however, I would also give more guidance on additional sites to use for forecasting weather based upon temperature data. Furthermore, I would like to incorporate more into this lesson with regard to precipitation, barometric pressure, and humidity relative to approaching weather fronts. As an earth scientist and ex-wildland firefighter, I know that predicting the weather has an important role in our daily lives, as well as our lives over an extended period. Finally, I hope to allow my students the opportunity to see the value in weather prediction and trend analysis, and apply this to their lives.

Image provided by National Drought Mitigation Center, University of Nebraska-Lincoln

http://drought.unl.edu/dm/monitor.html