

Oregon Coast STEM Center PBL Project Overview Section 2

Name of Project: _____Forecasting the Future_____

Name of Teacher(s): ___Alexis Sampson and Beth Kroiz _____

School & District: _____Tillamook Junior High School – TSD#9_____

In addition to the online PBL Project Overview, please describe the following in no more than 3 paragraphs per section.

1) How the Project was Conceived and Planned

During a STEM presentation by Near Space Corporation we were given an opportunity to use their equipment and facilities to launch weather balloons with students. We began thinking about how weather patterns in the Tillamook coastal region vary vastly between geographic locations. One side of town could be completely sunny while the other side is pouring rain. This is believed to be linked with land formations.

We planned to launch three weather balloons in three geographically different locations and compare the data collected. We collected weather data from the weather station in the classroom for about a month in order to observe weather patterns and eventually compare the station data with the balloon data. We decided to tether our balloon instead of releasing it so that we could control altitude and use the same balloon for all three launches. Students were given an opportunity to design different winch systems to reel in the balloon after each launch. While on the trip, students split up into four stations that rotated every 20 minutes: balloon launch and reel, mapping location of the site and cloud formations using GPS and compass bearings, measuring height of the balloon using inclinometers, observing data collection in the command center trailer.

Once students brought the data back to the classroom they chose two variables and investigated the relationship between them. They did this using a scatterplot (by hand and on iPad) and linear regression (Excel) to examine if there was a direct or inverse relationship. Students then wrote a scientific report and created posters on their findings.

2) How the Project was Managed

We had three separate groups going to three different launch sites for the field trip. The buses departed school at different times so that all three launches could use the same balloon. We needed two buses, two full-day substitutes (covering for absent teachers), one half-day substitute (chaperone on field trip), and one parent volunteer (chaperone on field trip). The natural resources coordinator for the district, Clair Thomas, assisted throughout the entire trip. Before the trip, students were instructed by each of the teachers and Clair Thomas on how to use the field instruments.

After the trip, students completed the data analysis, posters and reports in their science and math classes.

3) Your (or your team's) Reflection on the project after completion. Include what went well, what might be improved or changed if you were to do this project again, and what the most important student learning was.

It is challenging to do a long term, integrated project at the secondary level, and we felt like we were able to collaborate and remain flexible in dealing with these challenges. It seems like it's important to work with someone that has the same level of flexibility as you do. Because of these challenges many teachers at our school hesitate to do large projects. We felt that our students were excited to have an authentic field experience and work with real meteorologists. Using real data that the students collected themselves made the math and science concepts more meaningful and applicable to real life. As a result, we felt the concepts stuck with the students more than if we had simply done worksheets.

The nature of the field trip (weather) and the complexities of working with multiple people (office staff, teachers, NSC employees, transportation) made the scheduling of this trip very challenging and frustrating at times. However, we are very proud that we are still on speaking terms with everyone involved, most notably the main office secretary ☺ The trip had to be cancelled and rescheduled two times. We decided to involve high school volunteers during the field trip to help teach at the stations. This proved challenging because the students were not adequately trained (probably our fault) and ended up being more of a distraction than a benefit. For the next PBL, we want to involve high school students in the project long before the trip so that they are better prepared to be "mentors."

A big challenge was to truly integrate the math and science components across our two groups of students throughout the course of the project. The other math and science teachers in our building were not involved in the project however, they shared our students. Because different teachers were teaching slightly different content, it was a challenge to align math and science concepts concurrently to make them truly integrated and meaningful to the students. We think that to improve, it would require much more collaboration time and ideally participation among the entire math and science staff. Hopefully we can make this work during the next round!

4) Attach any student work samples, products, photos (that you have permission for), or additional documents you would like posted on the website with your Project Overview.

Email your Project Overview as a PDF, this document and any attachments you'd like to include to Ruth.mcdonald@lincoln.k12.or.us.

Your final \$750 pay will be processed as soon as it is received.