My paper is going to be about the shipwrecks in the Manitou passage. Our focus will be on whether or not they could have been prevented with modern technology? The students will start the unit off dealing with basic weather and weather predictions. We will make predictions based on physical observations of clouds and incoming fronts. There are several cloud identification charts posted throughout the room. I will have them make a journal of daily weather using the previous nights weather predictions from their local meteorologist. They will be instructed to use the same meteorologist and TV station or newspaper to get the next day’s weather prediction. They will make a chart and have predicted weather and then write down actual weather. We will do this for a week and look at the data and see how close the local meteorologist was in predicting the weather. The students will then try to associate certain weather patterns with their observations. The students will then infer why or why not some of the meteorologist’s prediction was not accurate. Some of the reasons might be due to lake effect, ‘hot spots’ or ‘heat islands’ (cities temp. being higher then surrounding out skirting areas), differences in elevation of the land? These would all be acceptable reasons. One of the chemistry teachers and I made a barometer. It works great; there are 5 observations you can get from the barometer. It is remarkable how accurate it is. I have been able to predict both snow days last year and several after school game cancellations due to weather, even when our physical observations of the weather in the morning were fair weather. We will be doing several mini labs figuring out dew point, relative humidity, wind speed, how to read isobars and relate wind speed to isobars with incoming fronts. Other labs will consist of map reading; how elevation is related to temperature and how dew point is directly related to the relative humidity do to the temperature of an area. Will also infer why areas along lakeshore do not have as drastic temperature change as inland areas. Why some areas get rain and why some areas 70 miles north get four inches of snow? The students will follow barometric readings and notice the change in barometric pressure and relate that to their physical observations of the weather, what happens when the barometric pressure changes drastically in a three-hour period and still keeps dropping? The students will be able to tell why an air mass of high pressure brings clear skies and why an air mass of low-pressure brings a gray day. The student will then be able to speculate how bad weather will be by knowing the relative humidity and temperature of colliding fronts, Cold dry meeting warm moist... ☹ scary weather!!!!!
Once the student is knowledgeable to some basic weather terminology and how it is put to use, we will then study the area of the Manitou islands and the shipping channel that has claimed so many ships. I think I will create a pre test to get a basic understanding of what the kids know. I will then try and find reference books and other types of information, movies…? The pre test will contain basic geographical aspects of the area so all the students know where it is we are talking about and what kids of geological landforms there are that may or may not affect incoming weather. They will study water depth and water temperature. They will find info on how many ships and their locations of the wrecks. They will also find out what year the ships wrecked and relate that to modern technology, which is unit two, using technology to measure weather. They are going to explain how satellites provide weather data. Describe how radar provides weather data, and how Doppler radar works using Doppler’s Principles. We will also talk about geostationary satellite and how GPS systems are used for navigational purposes. Could some of these wrecks have been prevented if the captain could see? Do you need to see to navigate a ship? How many ships after GPS grounded? How many ships prior to GPS grounded? I don’t even know? We will find out together.

In conclusion to my paper and project I will come up with a rubric on how they will be graded and I will also determine how in-depth I want them to present their research. I was thinking of giving them suggestions like: power point presentations, video in the form of a documentary, turn in a computer generated paper and short oral presentation? I will know more on the project after the first week of school. This project will take place approximately the 5-6 week of school.
1) Doppler radar systems send out **microwaves** to provide information about storms used by weather forecasters.

2) **High-altitude satellites** provide data about wind direction, wind speed, and precipitation.

3) Meteorologists are scientists who study:
   a.) Meteorites
   b.) Weather
   c.) Metric system
   d.) Metals

4) High barometric pressure is associated with what kind of weather

5) North and South Manitou Islands are located in Lake:
   a.) Superior
   b.) Michigan
   c.) Tahoe
   d.) Erie

6) Sleeping Bear Dunes National Park is located in:
   a.) North-Western Michigan
   b.) U. P.
   c.) Thumb Area
   d.) Central area of Michigan around Houghton Lake

7) The Manitou Island has never been inhabited by humans and is considered a wildlife Preserve (T or F)

8) GPS was first used by:
   a.) The army
   b.) The navy
   c.) The air force
   d.) The marines

9) Geostationary satellites are;
   a.) Weather satellites
   b.) Spy satellites
   c.) Dishes that you install to your house
   d.) Satellites that orbit opposite of the earth

10) Has weather forecasting and modern technology helped the shipping industry? (Yes or No)