

Nature of Science & Math: Analyzing the Presence in Everyday Communication

I chose to look at Jane Beitler's article, *Sea Ice Tracking Low in Both Hemispheres*, from February 2, 2018 to indicate how scientists use 3 of the tenets of the Nature of Science in their published work.

For the math article, I chose *Math Made Me a Packers Fan, and It's Going Great* by Blythe Terrell. I found this task more challenging, because I am less familiar with the Common Core Mathematics Practices.

•Scientific Investigations Use a Variety of Methods

In this same article, Beitler discusses the different methods used to support her claim. Scientists studied the ice to determine age, as "older ice is generally thicker ice". The decline in ice age has contributed to the low sea ice in both hemispheres.

Another method they used to test their theory is air temperature. The scientist compared air temperatures to those in the past several years, and they found that the air temperature, overall, has been higher, a likely contribution to the decline in sea ice.

Scientists also looked at general weather patterns, particularly how wind was traveling. "Strong winds from the north occurred...pushing ice southward in the Bering Sea, breaking up the ice in the Chukchi Sea," (Beitler, 6.) This wind data led scientists to look at oceanic current and ocean temperatures, and found that the temperatures were roughly 3 degrees Celsius higher than the average.

As evidenced above, good scientific thought comes from a large number of different methods, and those different methods can be used in conjunction to support evidence of a claim. Good scientists know that one method from one study usually is not enough to support a claim, and they will continue to try different methods to come to the same conclusion.

•Scientific Knowledge is Based on Empirical Evidence

In the article, *Sea Ice Tracking Low in Both Hemispheres*, Jane Beitler discusses multiple different data collections from a variety of years to support her claim.

She begins the article with the ice extents from January 2018 compared to January 2017, and how the record low surpasses previous data. Again, she supports her data using a variety of different graphs, which show ice extent over 5 months, arctic air temperature in January 2018, and Average Monthly arctic sea ice extent in January 2018 in the Barents Seas and Greenland. She further supports her point by using data from elsewhere in the world: Chukchi and Siberian seas, but overall, explain her point using the same type of data and graphs from the other hemisphere.

•Science is a Way of Knowing

"Science as a way of knowing refers to the belief that the actions of science are based on logic, evidence, and reasoning (<http://www.ces.fau.edu/nasa/introduction/science-way-knowing.php>). Throughout this article, Jane Beitler uses a variety of sources, methods, and data to support her claim that sea ice tracking is low in both hemispheres. Beitler knows that in order to persuade her audience, she must analyze and use the empirical evidence in an appropriate manner. Oftentimes, media or non-scientists take data out of context and use it to support a scientific claim. Using data out of context leads to misconceptions and doubts amongst the non-science public of climate change. Knowing this, Beitler understands that her data must be rooted in logic, evidence, and reasoning in order to be taken seriously.

•Model with mathematics

I choose this tenet, because Tarrell used a large data chart to choose the perfect time to cheer for during the football season. According to the Common Core website, “Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace (retrieved from: <http://www.corestandards.org/Math/Practice/MP4/>), and this article seems to sum up this concept very well. In this data table, it was listed by criteria and weight, using an online dating algorithm, and using that weight, the author was able to choose the Green Bay Packers as a team.

•Construct viable arguments and critique the reasoning of others

Terrel uses viable arguments in justifying their choice. For instance, they say, “...406 Packers squad in Week 11, I was ready to spend an off season finding reasons to feel better about their prospects in 2017,” where Terrel understands that this algorithm may not be enough reason to choose the Packers and more evidence may need to be collected but was willing to see the experiment through. Later in the article, Terrel states that the Packers finished the season with 6 wins in a row, and they were going to the playoffs, further justification that his algorithm might have actually worked.

•Use appropriate tools strategically

Terrel made a decision to allow a mathematical tool to choose which NFL team to follow for the 2017 football season. His tool was an analysis of the NFL teams with his colleague, using an online dating algorithm, using metrics they “cared about”, including suspensions of players since 2007; extra weight to crimes against women, wins per fan dollars spent, and ownership honesty and loyalty to core players and the community. They used this algorithm/data analysis tool to determine who to cheer on for the year, and it chose the Green Bay Packers.

References

Beitler, J. *Sea Ice Tracking Low in Both Hemispheres* February, 2018. Retrieved from: <http://nsidc.org/arcticseaicenews/author/jbeitler/>

Bleicher, R., Edwards, A., Henderson, A., & Lambert, J., Soden, B. *The Nature of Science* November 2016. Retrieved from: <http://www.ces.fau.edu/nasa/introduction/science-way-knowing.php>

Terrel, B. *Math Made Me a Packers Fan, and It's Going Great*. January 2017. Retrieved from: <https://fivethirtyeight.com/features/math-made-me-a-packers-fan-and-its-going-great/?addata=espn:frontpage>

Common Core State Standards Initiative Retrieved from: <http://www.corestandards.org/Math/Practice/MP4/>