Clare Gilroy Summer 2019
Methods of STEM Nature of Science Assignment

Article: Older People Are Contributing to Climate Change, and Suffering From It
Date: May 24, 2019
Author: Paula Span
Source:https://www.nytimes.com/2019/05/24/health/climate-change-elderly.html?rref=collection%2Fsectioncollection%2Fclimate&action=click&contentCollection=climate&region=stream&module=stream_unit&version=latest&contentPlacement=7&pgtype=sectionfront

Part A. Select 3 of the tenets of Nature of Science discussed in NGSS (listed below) and write a brief analysis of how the article meets each tenet.

• Scientific Investigations Use a Variety of Methods

In order to truly explore phenomena, multiple methodologies must be utilized. This article highlights connections between biology, environmental, and earth science. Span includes hard data about temperature changes, specifically in summer versus winter, energy consumption, as well as observations of plants. Towards the end of the article, Span mentions the connection of climate change to extreme storms. She even ties in a gerontologist who studies social, cultural, psychological, cognitive, and biological aspects of ageing. While this article mentions a variety of findings and links to other articles, it doesn't include the methods scientists utilize to collect such data. However, by coming at the issue from a variety of angles, Span legitimizes this idea that recent changes in energy consumption has affected our environment.

• Scientific Knowledge is Based on Empirical Evidence

In order to support scientific findings, data is key. Moreso, empirical evidence that is concrete, and clear gives irrefutable rationale for scientific claims. By including some hard data in the opening, Span legitimizes her cause early on. "In the nine Northeastern states, for instance, where average winter temperatures climbed 3.8 degrees Fahrenheit between 1970 and 2000, they have seen fewer snow-covered days, and more shrubs flowering ever earlier. And they have experienced hotter summers. In New York City, daily summer temperatures at La Guardia Airport have risen 0.7 degrees per decade since 1970, according to the city's Panel on Climate Change." I appreciate that the data Span cites is easy to picture- a clear increase in temperature over thirty years. However, I wish she included a data point about changes in fauna-- while explaining the changes in shubbery is helpful, supporting that idea with a number of plants that have bloomed later, died out, or become endangered would support her idea even more. By noting that temperatures have gotten warmer in both winters and summers over the course of tens of years, Span highlights that this data is not just a fluke.

• Science is a Human Endeavor

As humans, we have the power the change the future of our environment-- for better or for worse. I appreciate that this article focuses on the connection between increasing age leading to an increase in energy consumption. Span focuses on such a human need- the need to stay cool during the summer. This is something that so many people can connect to, and many can understand it's implications for adults. By highlighting just this issue, Span is able to bring the reader to her side of the issue. Additionally, the article mentions the creation of RISE. I love that the author included a grassroots movement to showcase that individuals can take action to make necessary changes, at any age. In thinking of utilizing this with my students-- if an elderly person can get involved to save the planet, why can't teenagers?

Part B. Select 3 of the practices in Common Core Mathematics Practices and write a brief analysis of how the article meets the math practice

• Reason abstractly and quantitatively

Citing quantifiable data, like the increase of 3.8 degrees Farenheit over 30 years during winter and 0.7 degrees Fahrenheit per decade in summer, this article provides clear data that temperatures are increasing. When possible, it provides specifics, like "The Chicago heat wave of July 1995, for instance, caused 514 heat-related deaths; people older than 65 accounted for 72 percent of the fatalities." I appreciate that Span not only cites the data of 514 deaths, but also puts it into perspective by emphasizing that it accounts for more than 70% of the heat wave deaths. However, one lacking aspect of this article is that Span cites and hyperlinks other articles, but it would be great if she could include figures and graphs to help visually demonstrate her ideas and scientific findings. No graphs are used throughout the article, which could really help the reader understand the connections. Especially considering visual learners or non-native english speakers, this could assist their understanding.

• Construct viable arguments and critique the reasoning of others

Besides just presenting her argument, Span consistently provides data that supports her idea from a variety of stakeholders. Furthermore, Span uses this evidence to support her idea that as age increases, the necessity to utilize energy also increases. "Consumption rose rapidly among the 30- to 54-year-old cohort — "the peak of having kids and larger houses," he noted — then stabilized when people reached their 60s. But "after 70, it goes up and it keeps going up," Dr. Estiri said." This data point is also relatable, and is easy for readers to contextualize the relationship between larger families and more consumption. However, Span doesn't quite get at the critique of just the elderly utilizing more energy. Span continues "The trend persisted when the researchers controlled for income and housing types, but it varied by geography. When the researchers looked at climate zones, they found that "energy consumption in warmer regions becomes really elevated for the older group... Why do older people use more juice? The study could not provide explanations, but "there might be more need for air-conditioning," Dr. Estiri speculated. "Or older people may not be able to maintain their homes as well" to conserve energy." Span highlights that there were no explanations provided, and includes one possible answer, but no others. While her focus is on the increasing elderly population, Span also fails to connect that the need for air conditioning is still relevant to families with young children. Span could include other perspectives, or perhaps her own, and reasoning about why older people "need more juice." One downside of this article is it does not appear to mention alternative theories and offer critiques. Span has plenty of data that supports her ideas and could refute other's if he were to include alternate theories.

• Look for and express regularity in repeated reasoning

Span highlights the patterns in the data for different seasons. Not only is the increase in temperatures happening in winter, it's also happening in summer. This article not only presents data points that support Span's claim that increased age leads to increased energy use, but also makes connections between the data and society. Span truly wants readers to understand that a side effect of the increased age of humans is the (environmental) cost of energy to keep them supported. For instance "Dr. Kinney and his colleagues found that the risk of dying from heat in New York City declined 65 percent from the early 1970s to 2006 as the proportion of households with air-conditioning surged." Span connects this data to reinforce the idea that the elderly need cooler temperatures to survive, which leads to utilizing more energy.

While completing this assignment, I noticed a deal of overlap between science and math principles. Previously, I would have thought it would be more challenging to integrate math into my science course. However, now I recognize the connection is already there; I just need to emphasize it more.