To analyze the Nature of Science and Math in scientific writing I chose an article entitled “Chernobyl vs. Fukushima: Which Nuclear Meltdown Was the Bigger Disaster?” (Weisberger 2019). This article compares the magnitude of the nuclear disasters that occurred in Chernobyl, Ukraine in 1986 and Fukushima, Japan in 2011 through a variety of different methods and critical lenses (Weisberger 2019). Below I will analyze how this article relates to three tenets of the nature of science from NGSS as well as three of the Common Core Math Practices. Incorporation of both these tenets and standards are essential to articles accurately representing science in the media.

NOS 1) Scientific Investigations Use a Variety of Methods

Throughout this article the author mentions numerous investigations of variables that have been tested at Chernobyl and then compares them to the Fukushima reactor meltdown; the first of which is the actual reactor meltdown itself. In Chernobyl there was only damage to one of the reactor cores but three of them experienced damage at Fukushima because in Chernobyl “…the reactor core unspooled very rapidly and violently” (Weisberger 2019 paragraph 4). In terms of radioactive waste, both reactors released similar radioactive isotopes through their meltdown but again Chernobyl released a greater quantity of them and had a fire that slowed the response of the people at the plant (Weisberger 2019). In contrast, when studying the numbers of deaths related to the meltdown, Fukushima had higher casualties but they were secondary to the reactor meltdown and caused by relief efforts more than radiation exposure (Weisberger 2019). Lastly, the author goes on to examine the widespread contamination from the meltdowns and contamination from the Fukushima reactor meltdown had reached the US in 2014, but Chernobyl was relatively isolated and saw rebounds to their ecosystems without widespread contamination (Weisberger 2019).

NOS 2) Scientific Knowledge is Open to Revision in Light of New Evidence

I believe it is safe to assume that many people, myself included, had once believed that nothing could survive in the area surrounding Chernobyl and that the meltdown had caused irreversible damage to the surrounding areas and ecosystems. In reality, upon investigating the region further and conducting more tests and site visits, the author states “But decades later, diverse wildlife communities appear to be thriving in the zone, in the absence of human inhabitants” (Weisberger 2019 paragraph 17). Without revisiting the area and conducting more tests on radiation levels, plant and animal life, and contamination spreading we never would have known this to be the case. In contrast, surrounding Fukushima they are seeing evidence of genetic mutations and had a much smaller evacuation zone, which may change the environments ability to rebound (Weisberger 2019).

NOS 3) Science Addresses Questions about the Natural and Material World

One of the reasons that this article sparked my interest was because the effects of the Fukushima reactor meltdown can be seen in America, and is much farther widespread than the contamination from Chernobyl (Weisberger 2019). I am sure that the spread of the waste is due to the location of the reactors as well as the wind patterns that move air in the upper atmosphere, but additionally, the water from the plants is the same water being recycled, circulated, and used today. From the article, California wine producers noted that they had an increase in radioactive cesium in their wine being sold (Weisberger 2019). This is important information for consumers to know and the presence of this radioactive isotope can affect other ecosystems if it is widespread. Once consumers and goods outside of the meltdown area are being affected, questions

relating to the natural world and the materials produced from it need to be addressed, and I believe this article does that.

CCMP 1) Reason abstractly and quantitatively

Throughout this entire article the author is able to look at and analyze the data that is being collected and then reason and come to a conclusion about the circumstances surrounding each of the meltdowns and their affects on both cities. In an abstract sense relating to the general animal population surrounding the meltdown area, the author states that “genetic mutations are on the rise” (Weisberger 2019 paragraph 15) in butterfly populations surrounding Fukushima but doesn’t explain the specifics in terms of quantity/type/breed as well as the impact on other plant and animal breeds (Weisberger 2019). The author also goes on to mention that within the area surrounding Chernobyl, there are “270,000 people in those countries developing cancers who otherwise would not have done so” (Weisberger 2019 paragraph 11). Providing both quantitative and abstract values to the impacts of the reactor meltdowns in both regions gives context to the far-reaching damage that each of these nuclear reactors had.

CCMP 2) Look for and express regularity in repeated reasoning

As the author is writing her article, she regularly brings the readers back to the main reason of the article, the comparison of which of the nuclear reactor meltdowns had the greatest effect, meaning the biggest disaster. She goes on to explain in the third paragraph the difference in each reactor meltdown and which one was worse, then again in the seventh and eighth paragraphs. The author is precise to ensure that she keeps repeating her reasoning and providing different pieces of evidence to support it in analysis of which meltdown was worse. In her conclusion, she again shows the repeated idea that Chernobyl has had more deaths and cancers because of the meltdown (Weisberger 2019).

CCMP 3) Construct viable arguments and critique the reasoning of others.

Lastly, when writing this article the author very clearly and thoroughly created her arguments logically and had various different types of analytical and qualitative data to back it up all the while adding in the arguments and data from other people supporting the conclusions. She quotes Greenpeace, the World Health Organization, and The United Nations to support her argument of which reactor meltdown was the worst. The author sites the United Nations in stating, “4000 people could eventually die of radiation exposure from Chernobyl” (Weisberger 2019 paragraph 11). In contrast, in her conclusions she states that in the area surrounding Chernobyl, “the exclusion zones would be widely opened to tourists” (Weisberger 2019 paragraph 18) but in the area surrounding Fukushima there are “ongoing concerns about safety during decommissioning and cleanup work” (Weisberger 2019 paragraph 20). The way that the author ends her article stating both of these quotes in contrast to each other shows that she still has critiques about the final conclusion of which of the two reactor meltdowns was the worst. The author includes evidence from others to support her main idea, comparing the damage and repercussions of the two reactor meltdowns, but allows the readers to draw their conclusions about which was the worst from the evidence and analysis she provided.

Weisberger, M. (2019, May 24) (Revised 2019, May 28). Chernobyl vs. Fukushima: Which Nuclear Meltdown Was the Bigger Disaster? Retrieved May 29th, 2019 from https://www.livescience.com/65554-chernobyl-vs-fukushima.html