Hurricane Matthew: Here are scenarios for the USA

by Doyle Rice of USA Today

Nature of Science & Common Core Mathematics Practice Analysis

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Part A: 3 of the tenets of Nature of Science discussed in NGSS

1) **Scientific Knowledge is Based on Empirical Evidence.**
   This article meets this tenet because they look and recognize the patterns and order to find the path of the hurricane. They use tools and technologies to make accurate measurements and observations of the hurricane. The knowledge of the hurricane Matthew is based on connections between the evidence and explanations. “Scientists look for patterns and order when making observations about the world. Science findings are based on recognizing patterns. Scientists use tools and technologies to make accurate measurement and observations. Science knowledge is based upon logical and conceptual connections between evidence and explanations” (NGSS Release. 2013, p.5)
2) **Science is a Way of Knowing.**
   The article describes how the top American weather model (the GFS) and the top European model (the ECMWF) were used to track the hurricane Matthew. This shows how many people from different nations contributed to the scientific knowledge of the hurricane. The knowledge of science was used by a meteorologist which is an example of science being used by many people, not just scientists. The knowledge, process and practices from previous hurricanes and hurricane Matthew are used to add to the body of knowledge about hurricanes. “Science is both a body of knowledge and the process and practices used to add to that body of knowledge. Science knowledge is cumulative and many people, from many generations and nations, have contributed to science knowledge. Science is a way of knowing used by many people, not just scientists” (NGSS Release. 2013, p.6)
3) **Scientific Knowledge Assumes an Order and Consistency in Natural Systems.**
   This article was able to predict the pattern of hurricane Matthew because science assumes that events such as hurricanes in natural systems occur in consistent patterns and can be understood through

measurement and observation of the data and evidence. “Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation. Science carefully considers and evaluates anomalies in data and evidence” (NGSS Release. 2013, p.6).

Part B: 3 of the practices in Common Core Mathematics Practices

1) **Reason abstractly and quantitatively.**
   This article describes the speed of the winds of the storms in miles per hour, so the units involved are considered to help understand the meaning and effect of the storm. “Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of the quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects” (Common Core State Standards Initiative, 2019).
2) **Model with mathematics.**
   This article models the mathematics by including a map of the possible hurricane path which uses a coordinate plane (graph) to determine the location of the hurricane at any given time. “They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas” (Common Core State Standards Initiative, 2019).
3) **Use appropriate tools strategically.**
   This article meets the math practice of using appropriate tools strategically because the article shows how they used different tracking tools to estimate the path of Hurricane Matthew, explore the consequences of the hurricane and compare their predictions with data. “When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data” (Common Core State Standards Initiative, 2019).

References:

Rice, Doyle. (2016, October 3). *Hurricane Matthew: Here are scenarios for the USA.* Retrieved from USA Today: http://www.usatoday.com/story/weather/2016/10/03/hurricane-matthew-usa-impact/91462552/

NGSS Release. (2013, April). APPENDIX H – Understanding the Scientific Enterprise: The Nature of Science in the Next Generation Science Standards [PDF file]. Retrieved from: https://www.nextgenscience.org/sites/default/files/Appendix%20H%20-%20The%20Nature%20of%20Science%20in%20the%20Next%20Generation%20Science%20Standards%204.15.13.pdf

Common Core State Standards Initiative. (2019). Standards for Mathematical Practice. Retrieved from: http://www.corestandards.org/Math/Practice/