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

A. Nature of Science:

- Scientific Investigations Use a Variety of Methods:

  This article reflects the variety of methods used by weather scientists to collect hurricane data and observations in order to analyze when hurricanes are most likely to occur. Data and images collected from satellites is one such method. At the beginning of the article is a satellite image of Hurricane Florence as it made landfall in North Carolina. The article also explains that wind speed and direction are two important measurements that determine wind shear, "the variation of the wind's speed or direction over a short distance within the atmosphere." According to the article, weaker wind shear is typical in late August and contributes to the development of weather systems that spawn hurricanes. In addition, warmer ocean temperatures of late summer are cited as a key factor in hurricane formation. Finally, a NOAA graph of "the number of tropical storm and hurricane days" presented in the article clearly shows that storms peak in mid-September.

- Scientific Knowledge Is Based on Empirical Evidence

  Wamsley lays out the evidence for why Atlantic hurricanes peak in mid-September in a simple, logical manner. She starts by asking why there are more hurricanes in September and immediately follows with, "The answer has to do with wind and water." After explaining how wind shear and ocean temperatures contribute to more storm development in September, Wamsley restates the facts: "Lack of wind shear in the atmosphere? Check. Tropical waters as warm as a bathtub? Check." She then provides the NOAA graph showing the data from one hundred years of storms spiking in mid-September. In this way, Wamsley emphasizes that patterns support scientific findings and thereby demonstrates the "logical and conceptual connections between evidence and explanation" (NGSS, 6).

- Scientific Knowledge Assumes an Order and Consistency in Natural Systems

  Wamsley names "September 10 as the day you're statistically most likely to find a tropical cyclone somewhere in the Atlantic basin." This statement, along with her inclusion of the NOAA graph showing the spike

in hurricanes and tropical storms in mid-September, illustrates the order and consistency evident in weather systems. Wamsley also writes, “Stronger wind shear in the spring fades through June and July, and by late August wind shear reaches a minimum.” This supports the conclusion that weaker wind shear promotes storm development in September.

B. CCSSM Mathematical Practices:

- MP2 Reason abstractly and quantitatively.

  Wamsley does not make an explicit connection to quantitative math reasoning in this article. Instead of providing specific, quantitative data for the wind direction, wind speed, and ocean temperatures that contribute to hurricane development, she uses qualitative statements such as “lack of wind shear” and “tropical waters as warm as a bathtub.” Readers have to then reason more abstractly. The only specific quantitative data in the article is contained in the NOAA graph. However, by reasoning from this graph, the viewer can conclude that hurricane season peaks in September.

- MP3 Construct viable arguments and critique the reasoning of others

  The point of Wamsley’s article is to provide a cogent explanation for why hurricanes peak in September. She uses observations about wind shear and ocean temperatures as well as historical data showing the occurrence of hurricanes by month to make her argument. Wamsley does not offer a critique of any scientist’s or other writer’s reasoning for why September is the peak.

- Model with mathematics

  Wamsley presents the NOAA graph as a mathematical model to visually represent the number of hurricanes and tropical storms that have occurred on each date from mid-May to the end of December for a one-hundred-year period. This graph visually supports her statement that September 10 is “the day you’re statistically most likely to find a tropical cyclone somewhere in the Atlantic basin.”

References

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