Authentic Data Integration: Making Sense of Yonkers' Weather Patterns

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Data Source: Apple Weather Data App on iPhones and iPads

Link: [Feature availability and data sources in the Weather app - Apple Support](#)

 [Check the weather on iPhone - Apple Support](#)

App Description: The app provides hourly and daily weather data for various variables such as air quality, air temperature, air pressure, precipitation, UV index, wind direction, wind speed, humidity, movement of air mass, etc.

Topic: 7th Grade Meteorologists Make Sense of Yonkers Weather Patterns

New York State Science Learning Standards:

MS-ESS2-5: Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.

MS-ESS2-6: Develop and use a model to describe how unequal heating and rotation of Earth causes patterns of atmospheric and oceanic circulation that determine regional climates.

ESS2.D: Weather and Climate:

Weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns.

The ocean exerts a major influence on weather and climate by absorbing energy from the Sun, releasing it over time, and globally redistributing it through ocean currents.

Related New York State Middle School Lab: How's the Weather Up There?

Lesson Enhancement: The weather data from Apple's weather app enhances the lesson of weather patterns and forecasting which is pedagogically aligned to the New York State middle school science standards. Using local weather data make the data collection and analysis process culturally relevant. By using the weather app, the students can investigate weather variables from different time periods and understand the complexities of meteorology such as the dynamic nature of air masses and their direction, a feature that is difficult to convey using static maps.

Personal Statement: Incorporating culturally relevant authentic data in the science class is valuable because it makes learning more meaningful for students. In addition, it aids in improving students' visual literacy skills. That is, students' abilities to "access, analyze, evaluate, and communicate information… [about] visual image" (Serafini, 2010, p. 87). To unpack the information found in various data models, such as animated weather maps, I incorporate a visual literacy framework leveraging empirical data from my research (Redway, 2023) where students identify the symbols, name/label them, interpret them, and weave them together to make a logical explanation. The framework facilitates students lifting their own cognitive load (Hammond, 2021).

Interdisciplinary Connections:

Mathematics: Students can create data tables and graphs of weather variables to practice data management, analysis, and interpretation skills.

Social Studies: Students can compare weather data from various locations to explore how geographic features such as oceans and latitude affect weather patterns.

Language Arts: Students can act as meteorologists and forecast the weather in a video presentation to improve their scientific communication skills.

References

Hammond, Z. (2021). Liberatory education: Integrating the science of learning and culturally responsive practice. *American Educator, 45*(2), 4. https://www.aft.org/ae/summer2021/hammond

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Serafini, F. (2010). Reading multimodal texts: Perceptual, structural and ideological perspectives. *Children's Literature in Education, 41*(2), 85-104. https://doi.org/10.1007/s10583-010-9100-5