# Teachers' Guide for Cobblestone

March 2012: The Perfect Storm: When Weather Made History

By Debbie Vilardi

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Goal: To explore historically significant weather events and meteorological changes.

*Always have a parent or trusted adult help with web research.

Before Beginning: Consider the worst weather you've seen on the news or been in. How did you prepare? Was it as bad as expected? Was it worse?

"Blizzard!" by Jeanie Mebane (Pages 2-5)

Vocabulary: blizzard

Comprehension:

1. How did the Schoolchildren's Blizzard form?
2. Why did it earn this name?
3. Why did Mae Hunt and her students leave their school?
4. How did they survive the storm?
5. How did the Barrys help the students in Nebraska?
6. Describe the Great White Hurricane of 1888.
7. What were some of the outcomes of these storms?

Writing Activity: Read "Storm of the Century" on page 5. Describe the importance of forecasting technology. How did it change the response to storms? Consider what would have been different in 1888 if the technology had existed then.

Research Topics: Blizzard formation, Schoolchildren's Blizzard, Great White Hurricane of 1888, National Weather Service, Storm of the Century

"A Famous Flood" by Marcia Amidon Lusted (Pages 6-8)

Vocabulary: morgue, flood stage, spillway

Comprehension:

1. Why was water in the streets common in Johnstown?

2. Describe the efforts to save the dam.

3. How did the man rescue Gertrude Quinn Slattery?
4. What was the worldwide response to the flood?
5. Why might the flood of 1936 have been less severe than the flood of 1889?
6. What steps were taken to prevent future flooding?
7. What were the results of the third flood in Johnstown?

Map skills: Locate Johnstown, Pennsylvania and Lake Conemaugh on a map of Pennsylvania.

Math Activity: If the 1889 flood killed one out of every ten people for a total of more than 2,200 deaths, about how many people lived in Johnstown before the flood?

Writing Activities: Imagine you arrived in Johnstown to help clean up from one of the floods. Describe what you might have seen and what you are doing to help.

Research: Johnstown flood, Works Progress Administration, Gertrude Quinn Slattery

"Fast-Moving Water" by Kathiann M. Kowalski (Page 9)

Vocabulary: Flash Flood, floodplains, wetlands

Comprehension:

1. How have population growth and property development led to an increase in flash floods?
2. What steps can you take to stay safe if flooding occurs?

Art Activity: Create safety posters for flood zones in your area or imagined areas.

Research: The risk for flooding in your area

"Swallowed by the Sea" by Julie Lake (Pages 10-13)

Vocabulary: hurricane, typhoon, barometers, anemometers

Comprehension:

1. How did the weather service receive information about storms in the late 1800s?
2. How was the hurricane warning broadcast to the population in 1900?
3. Why did people gather on the beach?
4. What destroyed the only evacuation routes?
5. How did the citizens get help?

6. Why were bodies burned instead of buried?
7. How has the seawall helped protect the city?

Map Skills:

1. Locate Galveston Island, Texas on a map of Texas.
2. See the map on page 12. Trace the path of the storm from Cuba to Galveston.

Writing Activity: You have survived the storm. You must decide whether to leave Galveston or remain in the city. Write your decision and support it with details from your imagined life.

Research: Famous hurricanes, Galveston, TX, Isaac M. Cline, Clara Barton, Saffir-Simpson Scale

Science: Research hurricanes and the effects of their rotation. Why do hurricanes have a worst side?

"Katrina Strikes" by Kathiann Lake (Page 14)

Vocabulary: storm surge, levee system

Writing Activities:

1. Compare the Galveston storm to Hurricane Katrina. Include the paths of the storms found on maps on pages 12 and 14.
2. Compare the levee breaches to the breach of the dam near Johnstown.

Research: New Orleans, LA

"Father of All Forecasters" by Charlene Brusso (Pages 15-16)

Vocabulary: barometric pressure, anemometers, hygrometers, meteorology

Comprehension:

1. What prompted Cleveland Abbe to become interested in the weather and weather forecasting?
2. When did Abbe's first forecast appear in a local newspaper?
3. Why was Abbe called "Old Probabilities?"
4. Why did Abbe train others and test equipment?

Math Activity: How many days separated the first local forecast and the first official national forecast? Write the answer as total days and as months and days.

Science Activity: Use thermometers, hygrometers, barometers and anemometers to measure weather conditions. Chart the results from each instrument. Discuss whether your data is sufficient for making weather predictions. Use your data and the symbols on pages 18 and 19 to create a local weather map.

Research: Cleveland Abbe, Weather Bureau

"At Your Fingertips" by Ruth Tenzer Feldman (Pages 17)

Research: National Oceanic and Atmospheric Administration, NWS Storm Prediction Center, NWS Climate Prediction Center

"Monster Tornado" and "Tornado Alley" by Ruth Spencer Johnson (Pages 20-23)

Vocabulary: Tornado, Doppler radar

Map Skills: Using information from the article, trace a possible path for the Tri-State Tornado.

Research: Tri-State Tornado, Doppler radar, Tornado Alley

"Covered in Dust" by Peter Roop (Pages 26-28)

Vocabulary: drought, topsoil, pneumonia

Comprehension:

1. How did farming practices contribute to the dust storms?
2. Describe some of the problems the dust caused.
3. How did the government intervene?
4. Why was the 1950s drought less severe?
5. What effect did population increases have in the 2011 drought?

Writing Activity: "Dust Bowl" humor helped people cope. Create your own jokes about stressful circumstances in your life.

Discussion: The "Dust Bowl" contributed to the Great Depression. Discuss how the drought in the Great Plains may have impacted other parts of the country.

Research: Black Sunday, Dust Bowl, Soil Conservation Service, 2011 drought

"Help Is on the Way" by Marcia Amidon Lusted (Pages 30-31)

Research: Federal Emergency Management Agency, National Guard, American Red Cross, Mission Groups

"How's The Weather up There: An Interview with Meteorologist Brian Clark" by Marcia Amidon Lusted (Pages 32-35)

Comprehension:

1. Why might the buildings on Mount Washington be chained to the ground?
2. Describe the three part mission of the observatory and one means of accomplishing each part.
3. How is the observatory like a weather balloon?
4. What is its relationship with NWS?
5. What does the observatory record that satellites can't and why is this important?
6. How has digital technology improved data access?
7. Why are paper charts still in use?
8. What is life like at the observatory?
9. Describe the danger of living on the mountain.

Writing Activity: Would you like to become a meteorologist? Why or why not?

Research: Mount Washington Observatory, Mount Washington, New Hampshire

"Be Prepared" by Felicia Truman (Pages 36-37)

Learn safety rules for the types of weather common in your region. Create a safety plan with your family and have a safety kit containing items in the storm checklist on page 37 and anything else you may need.

Activity for the Entire Issue: Discuss how technology has improved forecasting and the ability to warn people of all forms of natural disasters. Are forecasts accurate today? Should meteorologists continue to improve their forecasting capabilities? Are the warnings issued sufficient? Are they too broad? Are there better ways to issue warnings with new technology?