

Title: Why Should We Remember the Johnstown Flood?

Overview

This lesson will focus on the enormity and impact of the Great Flood of 1889. Students will use a variety of primary and secondary sources to analyze the short and long term effects on the city of Johnstown, Pennsylvania. It will look at the **Science** of floods, the **Technology** of inclined planes, the **Engineering** of a dam, and the **Mathematical** statistics of loss of life.

Investigative Question

Why Should We Remember the Johnstown Flood?

Objectives

Students will determine the impact of the flood on Johnstown and the surrounding communities. They will examine the cause and effect on legislative bodies, technology and industry. They will use facts to form their own opinion on why we should remember the Johnstown flood.

Time Required

Students will need approximately ten class periods of 60 minutes to complete this lesson.

Recommended Grade Range

Grades 6-12

Subject / Sub-Subject

Science (Environmental Science, Earth Science), Technology, Engineering, Mathematics

Standards

- 3.4.10.A2: Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- CC.2.1.HS.F.3: Apply quantitative reasoning to choose and Interpret units and scales in formulas, graphs and data displays.
- CC.2.2.7.B.3: Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.
- CC.2.4.2.A.4: Represent and interpret data using line plots, picture graphs, and bar graphs.
- CC.2.4.3.A.4: Represent and interpret data using tally charts, tables, pictographs, line plots, and bar graphs.
- CC.8.5.6-8.A Cite specific textual evidence to support analysis of primary and secondary sources.



- CC.8.5.6-8.B Determine the central ideas or information of a primary and a secondary source; provide an accurate summary of how key events or ideas develop over the course of a text.
- CC.8.5.6-8.G Integrate visual information (e.g. in charts, graphs, photographs, videos, or maps) with other information in print and in digital texts.
- CC.8.6.6-8.C Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- CC.8.6.6-8.H Draw evidence from informational texts to support analysis, reflection, and research.
- M04.D-M.2.1.3: Translate information from one type of display to another (table, chart, bar graph, or pictograph).
- S3.A.1.1.1: 3.4.8B4: Explain how societal and cultural priorities and values are reflected in technological devices.
- S3.A.1.1.2: Distinguish between fact and opinion

Credits

Twyla J. Haines



PREPARATION**Materials Used**

Library of Congress Analysis Tools/Worksheets (Maps, Motion Pictures, Photographs/Prints), Handouts (Flood Facts, How We Build Embankment Dams), Computer, Graphing Software, Movie (DVD/YouTube), Rubrics

Resources Used

- How We Build Embankment Dams
- Flood Facts
- Primary Source Analysis Tool (Student Version)
- The Johnstown Flood”, by Charles Guggenheim.
- [Library of Congress Analyzing Motion Pictures Tool](#)
- [Library of Congress Analyzing Photographs and Prints](#)
- [Library of Congress Analyzing Maps](#)

Works Cited

- Barker, George. *The Johnstown Calamity. A Slightly Damaged House*. 1889. Library of Congress, Washington, D.C. 20540 USA. *The Johnstown Calamity. A Slightly Damaged House*. Web. 11 May 2015. <<http://www.loc.gov/item/2012646804>>.
- Johnstown Flood*. Dir. Charles Guggenheim. 1991. *YouTube*. YouTube. Web. 09 May 2015. <<https://www.youtube.com/watch?v=WxXGh65IjiY>>.
- Lee, Alex Y. "Maps Bird's-eye View of the Conemaugh Valley from Nineveh to the Lake, Johnstown, Pa. : From Personal Sketches and Surveys of the Pennsylvania R.R. by Permission /." *Bird's-eye View of the Conemaugh Valley*. Library of Congress, 1889. Web. 11 May 2015. <<http://www.loc.gov/resource/g3824j.ct003257/>>.
- "Photos, Prints, Drawings Johnstown Local Flood Protection Project, Beginning on Conemaugh River Approx 3.8 Miles Downstream from Confluence of Little Conemaugh & Stony Creek Rivers at Johnstown, Johnstown, Cambria County, PA." *Johnstown Local Flood Protection Project, Beginning on Conemaugh River Approx 3.8 Miles Downstream from Confluence of Little Conemaugh & Stony Creek Rivers at Johnstown, Johnstown, Cambria County, PA*. Library of Congress, n.d. Web. 16 May 2015. <<http://www.loc.gov/item/pa3502/>>.
- "Primary Source Analysis Tool." *Primary Source Analysis Tool*. Library of Congress, n.d. Web. 09 May 2015. <<http://www.loc.gov/teachers/primary-source-analysis-tool/>>.
- "Timeline." *ReadWriteThink*. ILA/NCTE, n.d. Web. 09 May 2015. <http://www.readwritethink.org/files/resources/interactives/timeline_2/>.
- "Topics in Chronicling America - Johnstown Flood." *Johnstown Flood*. Library of Congress, 14 Nov. 2014. Web. 16 May 2015. <<http://www.loc.gov/rr/news/topics/johnstown.html>>.
- "Virtual Tour." *Virtual Tour*. Johnstown Area Heritage Association, 2015. Web. 15 May 2015. <<http://www.jaha.org/FloodMuseum/oklahoma.html>>.



Walker, Paul Robert., Gonzalez Vicente, and Neil Ardley. *Head for the Hills!: The Amazing True Story of the Johnstown Flood*. New York: Random House, 1993. Print.

Description of Procedure

Investigative Question

Why Should We Remember the Johnstown Flood?

Objectives

- Students will determine the impact of the flood on Johnstown and the surrounding communities.
- They will examine the cause and effect on legislative bodies, technology, and industry.
- They will use facts to form their own opinion on why we should remember the Johnstown flood.

Activities

1. View the [photo](#), “A Slightly Damaged House (Barker).”
 - a. Use the “[Primary Source Analysis Tool](#)” to document your observations, reflections, and questions.
 - b. Share and discuss observations, reflections, and questions with classmates and teacher.
 - c. Compile a list of three topics that may need further investigation.
2. Examine the [map](#) of the Conemaugh Valley (Lee).
 - a. Use the “[Primary Source Analysis Tool](#)” to document your observations, reflections, and questions.
 - b. Share and discuss observations, reflections, and questions with classmates and teacher.
 - c. Compile a list of three topics that may need further investigation.
 - d. A map usually includes a legend to tell the meaning of symbols on the map. Create a legend for this map for at least five different types of items.
3. Take a field trip to Johnstown.
 - a. Visit the Johnstown Flood Museum.
 - i. Select two questions from the list on the museum’s [Recipe for Disaster](#) to answer in paragraph form (Virtual).
 - b. Take a walking tour of downtown Johnstown.
 - c. Ride the [Inclined Plane](#).
4. Watch the Oscar winning documentary, “[The Johnstown Flood](#)”, by Charles Guggenheim (Johnstown).
 - a. Use the “[Primary Source Analysis Tool](#)” to document your observations, reflections, and questions.
 - b. Share and discuss observations, reflections, and questions with classmates and teacher.
 - c. Compile a list of three topics that may need further investigation.
5. Download the [data pages](#) from the HAER PA-413 project then find the actions taken by the city of Johnstown take to alleviate impact of flooding (Photos)?



- a. Utilize the [ReadWriteThink](#) website to create a timeline of actions taken by the city of Johnstown (Timeline).
6. Read the article, “How We Build Embankment Dams (Walker, 104).”
 - a. Make your own embankment dam.
7. Use the flood facts about victims to create separate pie graphs to depict the following (Walker, 91).
 - a. Percentage of Johnstown population who died in the flood.
 - b. Percentage of unidentified bodies.
 - c. Percentage of children who lost both parents.
 - d. Percentage of children who lost one part.
 - e. Percentage of wives lost in the flood.
 - f. Percentage of husbands lost in the flood.
8. Select one of the topics that may need further investigation from Activity 1, 2, or 4 to research then present your findings in an oral report.
9. Culminating Activity. Use the “Lessons learned: Why should we remember?” [questions](#) (Virtual) from the Johnstown Museum page to write an essay that addresses the essential question, Why should we remember? Additional information is available in the [Chronicling America](#) series (Topics).

Extensions

- Construct a scale model of the Johnstown Inclined Plane.
- Compare the Johnstown Flood of 1889 to a local disaster in your own town.
- Gather information from the Chronicling America series
<http://chroniclingamerica.loc.gov/>

Evaluation

All written assignments will be graded using the class Writing Rubric.

Activity 7 will be graded using the class Math Rubric.

Other assignments will be evaluated informally by observation.



How We Build Embankment Dams by Neil Ardley

An embankment dam forms a massive barrier across a valley. The front of the dam slopes down to the bottom of the valley, and it is covered with grass or bare rock. Often there is a road along the top of the dam. On the other side of the dam, the water rises almost to the top.

Sloping Sides

If you could see the whole embankment dam without the water, you would see a wall of soil or rock shaped like an enormous triangle. Both sides of the dam slope outwards from the top. The dam is built in a triangular shape so that it is thickest at its base, where the pressure of water against the dam is greatest.

The side that is under the water is often covered with rocks or stones, which protect the dam. Without this cover, waves would beat against the dam and tear away the soil.

Inside the Dam

An embankment dam is not naturally watertight. Water can seep through the soil and rock that form the dam. It can also seep through the ground under the dam. Seeping water can weaken the dam and could make it give way.

Therefore, embankment dams contain a core. The core is a barrier placed inside the dam to stop water from seeping through. Often it is made of clay, which does not absorb water.

Underneath the dam, there may be another barrier, called a cut-off or curtain, to stop water from getting through. The cut-off goes down into the ground until it reaches hard rock, so it may be very deep. Usually it is made of clay or concrete.

Preventing a Flood

Usually, there is a wide channel called a spillway at the side of an embankment dam. If the water in the reservoir becomes too high, water overflows into the spillway and through it, down into the valley.

The spillway keeps the reservoir at a safe level and prevents the water in the reservoir from flooding over the top of the dam. If that happened, the water would tear away the soil or rock in the dam, and the dam would collapse.



PRIMARY SOURCE ANALYSIS TOOL



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QUESTION

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FURTHER INVESTIGATION



Johnstown Flood Facts**The Victims** (Walker, 91)

Population of Johnstown	22,000
Total number of dead	2,209
Unidentified bodies	755
Whole families killed	99
Children who lost both parents	98
Children who lost one parent	470
Husbands who lost wives	198
Wives who lost husbands	124

