Full STEAM Ahead:
Connecting Library of Congress Primary Sources and Graphic Novels

Lesson Plan Template	
Author(s): Liz Williams & Sabrina Leaphart	
Grade Level(s): 4th Grade	
Subject: Science	
Length of Class: 2.0 hours (Four 30 minute sessions)	
 **Aerial photograph of flooding in Columbia, SC, at the confluence of the Broad and Saluda Rivers (looking upstream). Source: The South Carolina Army National Guard, October 5, 2015**	
Image Citation: **South Carolina Army National Guard. (2015)** ***Flooding at the Confluence*** **[Digital Image] Weather.gov** Service Assessment - The Historic South Carolina Floods of October 1–5, 2015	
Lesson Title:	Earth's Processes: Flooding and Prevention

Overview:	Students will learn about national & local flood events and will also participate in a STEM activity in which they will work in groups to find a way to prevent water from damaging their homes.
Learning Objective:	Students will use the science and engineering design practices to create flood prevention. Students who demonstrate understanding will generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.
Standards:	4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans. Clarification Statement: Examples of solutions could include designing earthquake or hurricane resistant buildings, improving the monitoring of tornadic or volcanic activity, and constructing waterways for floodwaters. State Assessment Boundary: Assessment is limited to earthquakes, floods, hurricanes, tornadoes, and coastal erosion. [SC College and Career-Ready Science Standards 2021] [Lesson sequencing framework is based on STEMscopes Science Curriculum]
Essential Question:	● How can you design a levee to protect your property from the flood waters? ● How can you prevent a flood from damaging your home using the materials provided? National Research Council 2012. A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas. Washington, DC: The National Academies Press. A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas
Supporting Question(s):	Asking questions and defining problems in experiences and progresses to specifying qualitative relationships. • Ask questions about what would happen if a variable is changed. • Identify scientific (testable) and non-scientific (non testable) questions. • Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.

Digital Primary and Secondary Sources:	List primary and secondary sources and include links. Primary: • Kenneally, B. A., photographer. (2006) Allysa Lemoine, New Orleans, Louisiana / Brenda Ann Kenneally. New Orleans, Louisiana, 2006. [July , 4/04/2011 printed 4 April 2011] [Photograph] Retrieved from the Library of Congress, Allysa Lemoine, New Orleans, Lou[i]siana / Brenda Ann Kenneally. | Library of Congress • *Today in history - August 29*. The Library of Congress. (n.d.). Retrieved December 9, 2022, from Today in History - August 29 | Library of Congress Secondary: • South Carolina Flooding: Dam Breach Triggers Full Scale ... • **South Carolina Army National Guard. (2015)** ***Flooding at the Confluence*** **[Digital Image] Weather.gov Service Assessment - The Historic South Carolina Floods of October 1–5, 2015** • Larson, K. & Nethery M. (2008). *Two Bobbies: A True Story of Hurricane Katrina, Friendship, and Survival*. Bloomsbury USA Children's
Required Classroom Materials:	Pencils Paper to draw design on scissors Cotton balls Drinking straws Paper towels Toilet paper Diapers Sand Pipe cleaners Tape Toilet paper/ paper towel rolls cup water small milk carton [to be used as the 'house' that students are trying to prevent from being flooded. aluminum pan [carton-house will be taped to the center of the pan and other resources will be used to build the barrier to keep water out of the carton-house] graphic organizer for the investigation [linked in the assessments section of the lesson plan]

	assessment [linked in the assessments section of the lesson plan] Read aloud: Two bobbies: The true story of Hurricane Katrina

Lesson Sequence/Procedures	
Estimated Time Needed	**Detailed Description of Teaching and Learning**
30 mins	**Hook-** ● Begin the lesson by showing students the NBC news report from Columbia, SC. ● Share photos and images from the 2015 flood as well. ● Discuss
30 mins	**Engage-** ● Read aloud *Two bobbies: A story of hurricane Katrina Book* by Kirby Larson and Mary ● This should be a close reading to explore knowledge and understanding of the characters, setting. plot, and understanding of the circumstances of the story. ● Show students resources from LOC about Hurricane Katrina and discuss/make connections ● Use the story and discussion as a segway to introduce the STEM challenge in the Explore section of the plan.
30 mins	**Explore-** ● Students will use the science and engineering practices to prevent a flood from damaging their home. Students will be proposed with the challenge of preventing a flood from damaging their home using the materials provided to them. They will work in groups with the materials provided to design a way to prevent water from getting into their home. ● Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. ● Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.

30 mins	**Elaborate-** ● Students will describe and record their struggles and successes in completing a home that is flood proof. ● Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.

Assessments:	Completion of performance assessment and investigations graphic organizer Resource: *Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.*
Learning Extensions:	Students can explore more on earthquakes, floods, tsunamis, and volcanic eruptions and create a Safety Brochure on one of the topics.