



## Build a Levee with STEM NOLA

LOUISIANA STATE MUSEUM

### Living with Hurricanes: Katrina and Beyond – Post-video Activity

Watch the video at: <https://louisianastatemuseum.org/education/virtual-field-trip/hurricane-katrina>

**Activity type:** Hands-on engineering and earth science experiment

**Objective:** By designing and building a levee with household objects, students will discover how different designs and materials impact the strength and effectiveness of levees and the role of levees in preventing floods.

**Louisiana Student Standards:** K-2-ETS1, K-ESS2-2, 3-LS4-4, 3-ESS2-1, 3-5-ETS1, 4-ESS3-2, 5-ESS3-1, MS-ETS1, MS-ESS3-2, HS-ESS3-1

## Introduction

A levee is a natural ridge alongside a river, or a human-made structure that prevents water from overflowing the riverbanks. Levees can protect people and property from flooding during storms or high-water events.

New Orleans is protected by a human-made levee system. However, during Hurricane Katrina, the levees failed in more than fifty locations. Investigations showed that the levees were poorly designed and constructed. Better levees could have prevented catastrophic flooding in New Orleans.

The exhibition and video tour “Living with Hurricanes: Katrina and Beyond” explained how faulty I-wall levees at the London Street, 17<sup>th</sup> Street, and Industrial Canals caused much of New Orleans to flood. Single sheet I-wall levees were too short, were vulnerable to water seeping under the sheet (underseepage), and became more unstable as soil eroded.

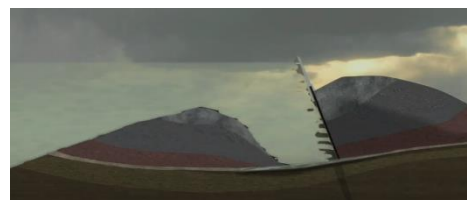
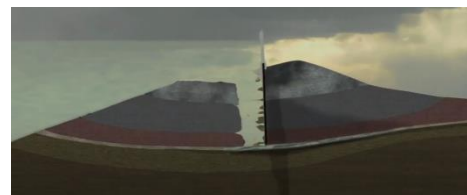
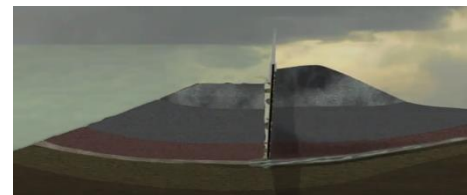
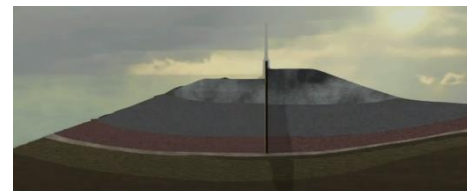
How can levees be more stable and resilient during a storm surge? Try different designs and materials to improve levee performance!

## Activity summary

**Design and build** a levee.

**Test** your levee.

**Redesign** and try again!



The graphics above show how an I-wall levee failed when underseepage and soil erosion caused a levee to slide and fall.



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## Related Standards:

K-2-ETS1	K-ESS2-2
3-LS4-4	3-ESS2-1
3-5-ETS1	4-ESS3-2
5-ESS3-1	MS-ETS1
MS-ESS3-2	HS-ESS3-1

# Levees: Save Your City



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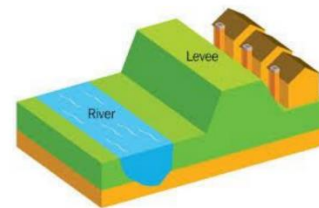
[www.stemnola.com](http://www.stemnola.com)

## Materials:

- |  |   |
|--|---|
| <input type="checkbox"/> Dirt            | <input type="checkbox"/> Plastic Container      |
| <input type="checkbox"/> Popsicle sticks | <input type="checkbox"/> Clay                   |
| <input type="checkbox"/> Cotton balls    | <input type="checkbox"/> Paper                  |
| <input type="checkbox"/> Plastic bags    | <input type="checkbox"/> Aluminum foil          |
| <input type="checkbox"/> Straws          | <input type="checkbox"/> Pitcher/Glass of Water |
| <input type="checkbox"/> Water           |   |

## Instructions:

1. Place 1-2 inches of dirt at the bottom of your container.
2. Thinking about the materials you have available, make a plan for how you'll build a levee to hold back water.
3. Create your levee according to your plan.
4. Pour the water onto one side of your levee and check to see if any water made it through to the other side.



## Liked this activity?

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[www.stemnola.com](http://www.stemnola.com)  
[STEMinSchools@stemnola.com](mailto:STEMinSchools@stemnola.com)

## Improve It!

Try changing your design or materials to make your levee more effective!

**What's the science behind it?** Levees are often built in places where there is a high risk of flooding in order to protect those communities from flooding. Levees are typically built with dirt, sand, and/or rocks, but sometimes, other materials like wood, plastic, metal, or concrete are used to make them stronger. In 2005, a strong storm surge from Hurricane Katrina broke and overtopped levees in New Orleans, flooding 80% of the city. Since then, the Army Corps of Engineers has worked to improve the city's levees to prevent this kind of damage from happening again.