

## Teacher Guide

## Lesson 10: Short and Long Term Resilience Planning

SKILLS:



**Lesson question:** What actions can we take to decrease hurricane risk and vulnerability in the short term and in the long term?

**Learning objectives:**

- Students identify actions that can be taken to decrease risk and vulnerability, increasing resilience, when a hurricane or tropical storm is approaching a coast.
- Students identify actions that can be taken to decrease risk and vulnerability due to hurricanes and sea level rise along their coast over the long term.
- Students gather information from multiple sources about the actions that can be taken and then assess which are most feasible.
- Students analyze and interpret a community resilience plan to consider the risks and benefits of various actions in terms of long term hurricane resilience.

**Timing:** Two class periods

**Materials:**

- Small dot stickers (eight per student)
- Small sticky notes in two colors
- Pens or pencils
- Paper
- One computer or tablet for each student or pair of students with Internet access
- **Day 1** Information sources for student research:
  - › The results of student analysis of Storm Stories from Lesson 3, Day 3 (which explored what people did to stay safe)
  - › [Ready.com/hurricanes](http://Ready.com/hurricanes)
  - › *Louisiana Homeowners Handbook to Prepare for Natural Hazards* (PDF\*)
- **Day 2** Information sources for student research:
  - › Storm Stories data for the last interview question
  - › [Ready.com](http://Ready.com/hurricanes) hurricane recommendations ([Ready.com/hurricanes](http://Ready.com/hurricanes))
  - › Case studies in the NOAA Resilience Toolkit ([toolkit.climate.gov/#case-studies](http://toolkit.climate.gov/#case-studies))
  - › *Louisiana Homeowners Handbook to Prepare for Natural Hazards* (PDF\*)
  - › *Rising Above: Climate Change Adaptation Manual for Communities in Louisiana*: pages 14-22 (PDF\*)
- Chart paper, marker
- *Six Resilience Projects for Terrebonne Parish, Louisiana* (PDF\*)
- Driving Question Board (used in previous lessons)



\*download this resource from  
[scied.ucar.edu/HurricaneResilience](http://scied.ucar.edu/HurricaneResilience)

**Preparation:**

- Review all information sources before class to prepare to facilitate student research.
- Bookmark links to information sources for students, or prepare printed copies if computers/internet are not available.
- Make printed copies of the *Six Resilience Projects for Terrebonne Parish, Louisiana*, or prepare to have students access the one-page PDF on computers or tablets.

## Lesson 10: Short and Long Term Resilience Planning

### Directions

#### Day 1

#### Introduce the activity.

- Introduce the lesson question: *What actions can we take to decrease hurricane risk and vulnerability in the short term and in the long term?*
- Tell students that in the first part of this activity, they will focus on short-term actions (e.g., what actions to take when a hurricane is heading towards the coast) that reduce risk and help us be more resilient. And during the next class, they will focus on long-term risks (actions that reduce hurricane risk decades into the future).

#### Compile a list of actions for short-term resilience.

- Split students into five groups and provide each group sticky notes (one color).
- Assign each group one of the questions from the Storm Stories analysis (Lesson 3, Day 3):
  - i. How did you learn that the storm was coming?
  - ii. Before the storm, what did you do?
  - iii. During the storm, what did you do?
  - iv. After the storm, what did you do?
  - v. What decisions have you made to stay safe from hurricanes in the long term?
- Tell students that their goal is to find and list actions for short-term resilience on sticky notes. Instruct students to consider both actions that individuals/families can take as well as actions that the whole community can take. Instruct students to gather actions from the following two sources for their group's question:
  - › Their Storm Stories analysis, which will reflect what people they interviewed did.
  - › Recommended actions from the *Ready.com/hurricanes* webpage.
- Create a space on a wall or on the board with two headings:
  - › Actions to Reduce Risks to Individuals.
  - › Actions to Reduce Risks to the Community.
- Have students hang all sticky notes under the appropriate heading on the wall. (*Note that actions to reduce risk to the whole community often need many people and community support to implement.*)
- Have each group take turns sharing out their resilience actions. As students present, have them group similar actions.
  - › Note: If there are differences between the actions that people took based on Storm Stories interviews and the actions recommended by the Ready website, discuss this as a class. Note that there might be many reasons that people don't take the advice of experts, some practical and some not.

#### Assess which resilience actions are most feasible.

- Tell students that some actions might be more feasible than others. (*For example, expensive actions won't work for people who don't have the money.*) Bring up the idea of feasibility as a way to determine which solutions could actually be implemented. Brainstorm together what factors would make a solution more feasible than another (*ex: implementation cost, time to implement, the scale of the solution, the consequences of not implementing, etc.*). Record these ideas in a new list, if desired.
- Give each student four dot stickers. Have students vote for two solutions from the Actions of Reduce Risk to Individuals list and two solutions from the Actions of Reduce Risk to the Community list that they feel are most feasible by placing a sticker next to them.
- Ask students what they notice about the resilient actions that got the most votes with stickers. Why did they vote for a particular action? (*Answers will vary depending on what actions are listed, but student answers will likely include mentions of cost, effort, impact, and time.*)

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### Think-Puzzle-Explore with another source of information about resilient actions.

- Introduce students to the *Louisiana Homeowners Handbook to Prepare for Natural Hazards*. Explain that every state has its own suite of natural hazards and its own needs for preparing. Louisiana is one of many states in the U.S. that needs to prepare for hurricanes and tropical storms, so that hazard is in this handbook.
- Instruct students to look at the handbook with a partner to research ways that individuals/families can protect their homes/property from hurricanes. Focus on the “Eight Things You Can Do to Prepare” on page five as a place to start.
  - › Have students jot down notes in three columns as they are going through using Think-Puzzle-Explore to frame their thinking. Instruct students to record ideas about how you could find the answers to your puzzlings and anything you think you’d like to learn more about. (Note: items recorded in the puzzle & explore columns might be useful for students during Lesson 11.)
    - i. Title the first column “Think” and record here anything you find interesting.
    - ii. The second column is titled “Puzzle” and is where you write down any questions that are coming up as you are reading.
    - iii. The third column should be titled “Explore.” Share out from the information gathering with the whole class, and discuss.
- Transition to the next day’s lesson by telling students tomorrow they will explore long term risks as they consider how to stay safe in the future.

### Day 2

### Introduce long-term resilience planning.

- Help students shift their thinking to consider risks in the future by having them calculate how old they will be in 2050 and ask them to think about what their life might be like then.
- Remind students of the top choice solutions for short-term hurricane resilience (i.e., when a storm is approaching) that they developed the day before. Ask students: What might be different when considering the risk of hurricanes in the future?
  - › *Students should recall what they learned about the combined impacts of stronger hurricanes and sea level rise in the future (Lessons 5-7), which will increase risk.*
- Tell students that in this lesson, they will look towards the future to plan for resilience in a world with stronger hurricanes and rising sea levels.

### Compile a list of actions for long-term resilience.

- Have students return to the groups that they worked with for the short-term resilience activity. Assign each group to one of the information sources below.
  - › Storm Stories; last question (about long-term changes made to stay safe)
  - › Recommended actions from [Ready.com/hurricanes](https://www.ready.com/hurricanes) (webpage)
  - › Recommended actions from the *Louisiana Homeowners Handbook to Prepare for Natural Hazards* (PDF)
  - › Examples profiled in case studies from the NOAA Resilience Toolkit (website)
  - › *Rising Above: Climate Change Adaptation Manual for Communities in Louisiana*: pages 14-22 (PDF)
- Students should spend about 10 minutes recording actions for long-term resilience on sticky notes (the second color) gathered from their assigned information source. Instruct students to consider actions at a variety of scales, including actions that individuals/families can take as well as actions that the community or region can take.
- Have students put all sticky notes from their group on a wall near the sticky notes gathered from the short-term resilience actions on Day 1. Instruct students to organize the long-term actions to reduce risks into categories by scale: (1) individual/household actions and (2) community/regional actions.
- Have each group take turns sharing out the resilient actions that they found in their source. As students present, have them group similar actions. Record the grouped actions on chart paper (or in a Google doc). (This list of short term/long term individual and community scaled actions will be used for Lesson 11.)

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- Allow students to vote (using dot stickers as they did earlier in Lesson 10) for solutions they feel are the most feasible. Give each student four stickers and allow them to vote for the top two in each category (individual/family, community/region).
- Ask students why they voted for particular actions. (*Answers will vary depending on what actions are listed, but student answers will likely include mentions of cost, effort, impact, and time.*)

### Case study: Will plans for Terrebonne Parish, Louisiana help decrease hurricane risk?

- Orient students to the resilience plan for Terrebonne Parish, Louisiana.
  - › The plan was developed with input from community meetings with Parish residents. (This was part of a larger process creating plans with six coastal Louisiana parishes coordinated by LA SAFE.)
  - › The community used data about expected changes to environmental conditions (flooding and land loss, as well as other conditions) over the next 50 years to inform their discussions.
  - › The plan was developed to address many different obstacles to resilience, not just sea level rise and storms, so it reflects all sorts of resilience challenges - economic and social as well as environmental.
  - › Based on the community input, the project created plans for six projects.
- Provide each group with the handout, *Six Resilience Projects for Terrebonne Parish, Louisiana*, and instruct students to look at the project boards online ([lasafe.la.gov/project-boards/](http://lasafe.la.gov/project-boards/)) for a more detailed description of each.
- Working in their groups, have students assess how the six projects will affect community risks of damage due to hurricanes and sea level rise in the future.
- Have them use the claim-pass strategy to consider whether the planned changes will help and if they think those changes will be enough.
  - › **About the claim-pass strategy:** In groups, students develop a written “discussion” through this strategy, contributing their ideas to a group document following the steps below:
    - One student writes a claim such as “Yes, I think the planned changes will be enough because \_\_\_\_.” or “No, I don’t think the planned changes will be enough because \_\_\_\_.”
    - They pass it to a second student who continues writing, adding to the initial claim or countering it. For example, “I agree because \_\_\_\_” or “On the other hand \_\_\_\_”
    - They pass it to a third student. After the paper has passed through everyone in the group, the first student reads it aloud to the group.
- Wrap up by taking a survey of how many students agree/disagree that planned changes would be enough to keep the community safe from hurricanes in the future. Ask students what else they would recommend for this community.

### Update the Driving Question Board.

- Have students return to the Driving Question Board to see whether there are questions that can now be answered or questions that should be changed based on what we know now. Have students consider whether they have new questions to add to the board now that they have considered short and long term actions to increase hurricane resilience.

### Opportunities for Assessment

- **Day 1**
  - › As groups share their resilient actions with the class, ensure that they have identified the major strategies from both the Ready website and Storm Stories.
  - › After students vote for the resilient actions and are discussing the outcome, pay attention to the reasons that students provide for why certain actions are more feasible than others to ensure that students understand what makes certain actions feasible (such as cost, effort, impact, and time). If time allows, add an exit ticket describing whether a particular action is feasible and why if you would like more detail about individual student learning.
  - › The tables that students create during the final part of the lesson (Think-Puzzle-Explore) will illuminate how students are processing new information about strategies for resilience. This can inform how you support student learning during the next lesson as students will be focusing on processing information from multiple sources about long-term resilience.

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- **Day 2**

- › As groups share their actions for long term resilience, ensure that they have identified the main ideas presented in their information source.
- › After students vote for the resilient actions and are discussing the outcome, pay attention to the reasons that students provide for why certain actions are more feasible than others to ensure that students understand what makes certain actions feasible (such as cost, effort, impact, and time).
- › If you'd like to assess student answers in the claim-pass activity (which is part of the case study), have students include their names with their individual answers and then collect the written "discussion" at the end of class. Their answers should document their thinking about whether a given set of actions will address hurricane risk.

### Teacher notes

- The Ready.com website, which is where the reference material is from, is a U.S. public service campaign to educate and empower people to prepare for, respond to, and mitigate emergencies, such as hurricanes.
- *The Louisiana Homeowners Handbook to Prepare for Natural Hazards* was developed by the Gulf of Mexico Alliance and published by Louisiana Sea Grant with support from NOAA, Sea Grant, EPA, FEMA, the State of Louisiana, and many other organizations. The goal of the handbook is to help residents prepare for natural hazards (including tornadoes, hurricanes, and floods) to help reduce risks to people and property.
- Note that Storm Stories might not include as much detail about long-term actions because they were geared towards describing a short-term situation (a particular hurricane). The final question in the questionnaire is the only one related to long-term changes. Recommendations from expert sources are included so that students generate a range of ideas.
- You may wish to substitute resources in the list that students use to generate ideas for long-term resilience, depending on your local area. Resources specific to your region would be good to include if they are available.
- For the case study, you may wish to substitute the long-term resilience plan for your local area if one exists. This will help students make a place-based connection. If your community doesn't have a long-term resilience plan, the case study will allow students to think about what long-term planning for coastal communities can look like.