



Floods 6–8

Flood Safety



Visit the American Red Cross Web site
at www.redcross.org/disaster/masters

LESSON PLAN 3

Flood Risk

People across the United States have built homes and businesses on floodplains—land that is subject to flooding. This increases the probability of damage and loss of life from flash floods. It is important for communities to know their flood risk and ways to protect their property.

Key Terms and Concepts

berm	dam	floodplain
canals	flood risk	levee
channels	flood walls	mitigation

Purpose

To determine community flood risk and ways to control flooding

Objectives

The students will—

- Research to learn about flood risk and mitigation for their community and prepare questions for a roundtable discussion with local experts.
- Use *Modeling Floods* and a stream table to experiment with ways to control flood risk in their community.
- Write descriptions of their flooding models, their potential for use within the community and possible mitigation efforts.
- Create large salt maps showing the topography of the community, its floodplains and its waterways. (Linking Across the Curriculum)
- Research community plans to promote flood preparedness and safety and write editorials that either support these plans or call for greater community action. (Linking Across the Curriculum)
- Use a Web site from the Federal Emergency Management Agency to learn who is at risk from a flood and the cost of flooding and to determine whether flood insurance is advisable for people living in a designated area.
- Find the Flood Risk Profile of their own school and determine whether flood insurance is advisable for people living in the area; write a simple brochure to alert the community to their flood risk and the availability of flood insurance.
- Help their families to assess their flood risk profile and inform them of insurance protection they can use to protect their homes. (Home Connection)



Floods

6-8

LESSON PLAN 3

Flood Risk

- Learn about the designations WATCHES and WARNINGS and correlate current weather conditions and forecasts to flood potential. (Linking Across the Curriculum)

Activities

- “Flood Control”
- “The Cost of Flooding”

TEACHING NOTE Use this lesson in combination with Lesson Plan 2 to help the students understand flood risk as well as control.



Visit the American Red Cross Web site
at www.redcross.org/disaster/masters



Floods 6–8

LESSON PLAN 3 Flood Risk

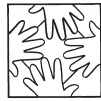
Materials

For each group:

- *Modeling Floods*
- Very large pan or flat plastic tub
- Modeling clay
- Toy houses, buildings and cars (game-piece size)
- Water
- Map of the area showing physical features and elevations or topographical map of the area



Visit the American Red Cross Web site
at www.redcross.org/disaster/masters



"Flood Control"

SET UP 30 minutes **CONDUCT** two 35-minute classes

Science: Earth Science and Problem Solving; **Language Arts:** Research and Writing; **Social Studies:** Geography

1. Contact your local chapter of the American Red Cross, your local emergency management office or your planning and zoning department and invite representatives to participate in a roundtable discussion with the class on flood risk in the area and community actions to prevent or prepare for flooding.

2.  Before the visit, teach students the following flood-related vocabulary:

berm
dam
canals

channels
flood risk
flood walls

floodplain
levee
mitigation

3. Once they have learned the terms, assign the students research to prepare questions about flood risk and mitigation throughout their community.
 - Is our community in a floodplain?
 - Is our community at risk for urban flooding?
 - What problems with flooding have we had in the past?
 - What actions have been taken to prevent flooding disaster? Dams? Levees? Channels? Berms? Flood walls?
4. Based on the information, have the students rank their community according to flood risk and flood preparedness using a scale and ranking system they have developed.



Wrap-Up

Use the following stream table models to reinforce the broader, community-wide picture of flood risk and control.

1. Distribute *Modeling Floods*.
2. Have the groups use local maps to simulate sections of their community that are at risk for flooding.
3.  Students will test ways to mitigate some of the hazards with, for example, levees, berms, flood walls around buildings and rezoning to prevent further building in floodplain areas.
4. After implementing some of their changes, the students will demonstrate whether the changes made the flooding less damaging to the area. Why or why not?



Floods

6–8

LESSON PLAN 3

Flood Risk

Materials

To make salt dough:

- 1 part white flour
- 1 part salt
- Enough water to make the mixture like modeling clay



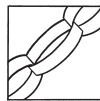
Visit the American Red Cross Web site
at www.redcross.org/disaster/masters



Have the groups share their findings with the experts in the roundtable. Have them discuss—

- Which mitigation efforts have already been completed by the community?
- Are there some changes they would recommend for community action?
- Are some efforts not possible or practical in your community? What are the difficulties?

Have the students write thank-you notes to the roundtable participants and include descriptions of their flood models and their potential for use within the community.



Linking Across the Curriculum

Social Studies: Geography

Work with student groups to create large salt maps of different parts of their community, its floodplains and its waterways. Have the students flag areas that have the greatest flood risk, as well as areas in which mitigation has decreased the risk of floods. Place the salt maps together and display them in the media center or work with a local mall to set up a display along with flood safety demonstrations and materials.

Language Arts: Writing; Social Studies: Civics

If your area is at high risk for floods, research community plans to promote flood preparedness and safety. Write an editorial for the local or school newspaper that either supports these plans or calls for greater community action.



Floods 6–8

LESSON PLAN 3 Flood Risk

Materials

- Computer, printer
- Access to the Internet
- Materials for creating community brochures or posters



Visit the American Red Cross Web site
at www.redcross.org/disaster/masters



"The Cost of Flooding"

SET UP 10 minutes **CONDUCT** two 35-minute classes

Science: Technology and Earth Science; **Language Arts:** Research

TEACHING NOTE If it is not feasible for the entire class to access the Internet, you could assign small groups of students to complete the activity in the media center and report their findings. Also consider printing information from the site and distributing copies for students to analyze.

1. Have the students access a Web site from the Federal Emergency Management Agency (FEMA), FloodSmart.gov (www.floodsmart.gov), to find information about the loss from floods. Click "interactive demo" under the heading "Prepare."
2. What is the cost to an average homeowner when floodwater rises one inch? Five inches? Ten inches?
3. Investigate the five scenarios under "Flood Risk Scenarios."
 - Snow melt
 - Flash flood
 - New development
 - Dams/levees
 - Tropical stormFor each Flood Risk Scenario, determine—
 - The source of water
 - Why the water is not absorbed into the ground
4. Have the students read through the information under "Flood Zones Defined" (in the left column). Ask the class: If you looked at a flood risk map of your home, what letter designation would you hope to find? Why? What would be the worst designation you could find? Why?
5. Investigate the flood risk to a location in Atlanta, Georgia, that is on a floodplain. Submit the following address to the Web site: 8 Peachtree Battle Ave. NW, Atlanta, GA 30305.

Is the site in a zone safe from flooding? Click "View Your Flood Map" located to the right of "Your Risk Profile" to find a flood risk map for the location. Then, have the students enter the address information at the FEMA Mapping Information Program Web site under "Map Viewer."



Floods 6–8

LESSON PLAN 3 Flood Risk

6. Using the map, assess the danger of flooding for the location. Where is the source of water that could flood the area? Is the address located in the historic flood zone? How close is this dangerous area? Would you recommend flood insurance for the people living in the area? Explain.



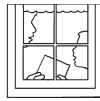
Wrap-Up

Now that the students have assessed the risk to a location in Atlanta, Georgia, have them repeat the steps for your school's address. Ask the class: Are you in a high risk area for floods? What would be the source of water if flooding occurs? What kind of flood would you be likely to experience?

Have the students return to the FloodSmart home page and click "Protect." Ask them to explore this site, paying special attention to "How to Purchase Flood Insurance" and "Flood Insurance: What and Why?"



As a class, use the information you have discovered to create a simple brochure or posters to alert the neighborhood about their flood risk and how best to protect their property.



Home Connection

Have the students share their findings at home with their families. If possible, have them use the FloodSmart.gov Web site to guide them in a flood risk assessment for their home. Using information from the FEMA Web site, have the students discuss preparations their families have in place, or may want to put in place, to protect their homes from the damages of possible flooding.



Linking Across the Curriculum

Science: Technology; Science: Meteorology

Direct students to the current weather site of the National Oceanic and Atmospheric Administration at <http://www.nws.noaa.gov/> to find and learn about the designations WATCHES and WARNINGS. Click current warnings and forecasts for their area and correlate any possible severe weather with its flood potential information. How will the weather affect potential flood areas?



Visit the American Red Cross Web site
at www.redcross.org/disaster/masters



Modeling Floods

Page 1 of 3

Name _____

Directions: Follow the steps below to model, simulate and test possible ways to mitigate flooding in your local community.

What you need—

- Map of community waterways and floodplains
- Very large pan or flat plastic tub
- Modeling clay
- Toy buildings and cars (game-piece size)
- Water

What to do—

- Using the map as your guide, mold the modeling clay into the pan to simulate the landscape of a specific area waterway. If appropriate, include toy buildings, etc.
- Draw your model:





Modeling Floods

Page 2 of 3

- Pour water into the waterway to a normal “stage.”
 - Begin to add water to simulate flooding conditions. What happens?
-
- Remove the water and begin mitigation. You may choose to add levees, berms, or flood walls; build a flood-control dam upstream; or dig irrigation channels or canals. Illustrate your changed landscape:

- Add water to simulate flood conditions. What happens?
-





Modeling Floods

Page 3 of 3

Analysis:

1. Does mitigation decrease the risk of flood damage? Which mitigation efforts work best?

2. Which mitigation efforts are already in place in your community?

3. Which would you recommend? Why?

