

Preparing to Cope with Floods

By Molly Clawson

California University of Pennsylvania

Grade Level: 6-8

Lesson Topic Title: "Preparing to Cope with Floods"

Learning Objective:

- After reading the flood information sheet, students will comprehend how communities can be more protected against floods and relate this information to the Stop Disasters Game.
- By playing the Stop Disasters Game (simulation), students will construct buildings in a city in the most flood-safe positions, in order to accommodate shelter for every city inhabitant.
- While playing the Stop Disasters Game, students will select certain buildings in a city to upgrade with different flood preventive measures.
- While playing the Stop Disasters Game, students will identify where to place certain flood defenses, like trees and wetlands.
- While playing the Stop Disasters Game, students will differentiate what to build and upgrade based on the given budget.
- When given their report of pass or fail of the Stop Disasters Game, students will discuss with group what they did right (if passed) or should have done (if failed).
- After class discussion, students will summarize in a journal why their flood plan was a success (if passed) or what they could do differently to make it a success (if failed) and turn it in to be scored according to a rubric.

PA Academic Standards:

- PA.R.1.1.8.H.3 – *Learning to Read Independently*
- PA.R.1.5.8.F - *Quality of Writing*
- PA.R.1.6.8.E - *Speaking and Listening*
- PA.SCI.3.1.7.E.3 - *Unifying Themes*
- PA.SCI.3.5.7.C - *Earth Sciences*
- PA.ENV.4.8.7.C - *Humans and the Environment*
- PA.SS.EC.6.3.6.D - *Scarcity and Choice*
- PA.SS.G.7.2.6.A - *The Physical Characteristics of Places and Regions*
- PA.SS.G.7.2.6.A - *The Physical Characteristics of Places and Regions*
- PA.HSPE.10.3.6.A.1 - *Safety and Injury Prevention*
- PA.FACS.11.1.6.A - *Resource Management*

*Standards can be found at <http://www.pacode.com/secure/data/022/chapter4/s4.83.html>.

Content Description:

Flooding is a very serious phenomenon, and it is important to be prepared in case one occurs near you. A flood can be caused by a number of things, like overflowing rivers (river flooding), a large amount of rain in a short amount of time (flash flood), an unusual inflow of seawater onto land (ocean flooding), etc. While there is often no way to stop the flood from occurring, there are some preparing and preventive measures that can be taken to minimize the possible negative effects of flooding.

Pre-Assessment

Assessment Procedures:

- Ask if anybody knows what a floodplain is.
 - Call on a volunteer if there are any
 - If nobody volunteers, you may need to do a quick mini-lesson to explain what a floodplain is. A good definition of floodplain can be found at: <http://www.fema.gov/pdf/nfip/manual200610/21def.pdf> or <http://www.srbc.net/pubinfo/docs/FPM%20Fact%20Sheet.pdf>
- Pass out a sheet of paper to each student.
- Have everybody write down 3 things to think about when building near a flood plain.
 - You may want to prompt them. For example, you could say, "I don't know about you, but if I were going to live near a floodplain, I would probably want to ..."

Instructional Activities & Procedures:

Introduction:

"We have a very important mission today! There is a city in Europe that needs our help. They fear they are at risk for a flood, so we need to make sure that they are prepared! Houses need to be built and/or upgraded; hospitals and schools need to be built; and we have \$50,000 to use to do this! But we have to be smart and use what we've been learning about floods to make this the safest city we can!"

Development:

- Have students go around the class reading the "How can communities be more protected against floods?" (Before the Flood) portion of the floods fact sheet
 - Tell students to pay extra attention during the "Undertake Structural Measures," "Land Planning," and "Increase Building Resilience". This will help with the stop disasters game.
 - Have students highlight these headings in some way, so that they can refer to them while they play the game if needed
- Assign groups to play the Stop Disasters Game, no more than 3 people/group
- Have your computer visible via Elmo projector and go through process to start the game with the students
 - To play game:
 - Go to www.stopdisastersgame.org

- On right side, click blue box that says, "Play Game"
- Have students read text as it comes up on screen
- Click "Launch Game"
- Click "Instructions" and read them aloud
- Click "Play Game"
- Click on the flood scene (bottom left scene) and then on EASY (small map) – it will then load the game
- Have students read the mission instructions aloud (go around class)
- Have students click on "Show Risk," at the bottom of the game, beside "Map." (Make sure the squares on the map have colored outline)
 - Have a student read the key fact
 - Explain that different colors on the map represent different flood risk:
 - Magenta = 100%
 - Red-orange = 75%
 - Orange = 50%
 - Yellow = 25%
 - Green = 0%
 - *Upgrading the buildings can reduce risk*
- Explain that when you click on a highlighted square on the map, you can either click on "Upgrade," "Demolish," "Develop," "Defenses," or "Info."
 - Tell students that reading "Info" may help them to make good decisions
- Let groups know that whichever group finishes with the most points wins (whatever reinforcement you choose) and give them time to play game
- It will take about 20-25 minutes
- Each group will either pass or fail, according to the guidelines of the game (certain things need done and a certain number of points need to be accumulated)
 - After the game is over, a newspaper article will appear. After reading it, have the groups click on "View Report" to see how they did; then click on "Continue" to see if they passed or failed
 - The team to get the most points wins, and gets some type of reinforcement, for creating the most flood-prepared city
- As students play game, go from group to group, for support if they have questions. Also, ask questions to make sure they are learning

Questions:

Here are some questions you could ask as you visit the groups:

- What is a key fact you've uncovered?
- What did you do that uncovered that key fact?
- Why did you put a concrete house there?
- What types of upgrades are available?
- Why did you do that upgrade to that building?
- How many people do you still need to provide shelter for?
- Where do you think it would be a good idea to put some trees? wetlands? drainage ditch? Etc.

Conclusion:

- While they are still in groups, have them think and share about:
 - If they passed – what they did that contributed to making their flood planning a success
 - If they failed – what they could do differently to make their city flood plan a success (in other words, what could they do to pass next time)
- After the groups have shared their ideas for about 5 minutes, have a class discussion on the ideas they came up with

Post-Assessment:**Assessment Procedures:**

Journal entry – after the discussion, have students write a journal entry in which they record:

- If they passed – what they did that contributed to making their flood planning a success
- If they failed – what they could do differently to make their city flood plan a success (in other words, what could they do to pass next time)

Materials List:***Teacher:***

Paper for each student

Flood fact sheets

Elmo overhead projector (if you have one available – if not, you just won't have your screen projected for students to see)

Reinforcement for winners

Student:

Writing utensil

Journal

Computer (at least 1 for every 3 students)

Citations and Resources:

Definitions. Retrieved October 20, 2008, from FEMA Web site:

<http://www.fema.gov/pdf/nfip/manual200610/21def.pdf>.

Flooding fast facts. Retrieved October 6, 2008, from Stop Disasters! Web site:

http://www.stopdisastersgame.org/en/pdf/Flooding_fact-sheet.pdf.

Information Sheet: Sound Flood Plain Management Practices Within Pennsylvania. Retrieved October 20, 2008, from SRBC Web site:

<http://www.srbc.net/pubinfo/docs/FPM%20Fact%20Sheet.pdf>.

Playerthree, Stop disasters! Retrieved October 6, 2008, from Stop Disasters! Web site:

<http://www.stopdisastersgame.org>.

Journal Rubric:



Stop Disasters Game Journal Entry

Name: _____

Teacher: _____

Date Submitted: _____

Title of Work: _____

	Criteria				Points
	4	3	2	1	
Main/Topic Idea Sentence	Main/Topic idea sentence is clear, correctly placed, and is restated in the closing sentence.	Main/Topic idea sentence is either unclear or incorrectly placed, and is restated in the closing sentence.	Main/Topic idea sentence is unclear and incorrectly placed, and is restated in the closing sentence.	Main/Topic idea sentence is unclear and incorrectly placed, and is not restated in the closing sentence.	—
Supporting Detail Sentence(s)	Paragraph(s) have three or more supporting detail sentences (at least three reasons they passed/could pass) that relate back to the main idea.	Paragraph(s) have two supporting detail sentences that relate back to the main idea.	Paragraph(s) have one supporting detail sentence that relate back to the main idea.	Paragraph(s) have no supporting detail sentences that relate back to the main idea.	—
Elaborating Detail Sentence(s)	Each supporting detail sentence has three or more elaborating detail sentences.	Each supporting detail sentence has at least two elaborating detail sentences.	Each supporting detail sentence has one elaborating detail sentence.	Each supporting detail sentence has no elaborating detail sentence.	—
Legibility	Legible handwriting, typing, or printing.	Marginally legible handwriting, typing, or printing.	Writing is not legible in places.	Writing is not legible.	—
Mechanics and Grammar	Paragraph has no errors in punctuation, capitalization, and spelling.	Paragraph has one or two punctuation, capitalization, and spelling errors.	Paragraph has three to five punctuation, capitalization, and spelling errors.	Paragraph has six or more punctuation, capitalization, and spelling errors.	—

				Total---->	—

Teacher Comments:
