

(Battling Natural Disasters)

Lesson Overview: Students take on the identity of urban planners and disaster managers as they attempt to thwart an oncoming disaster within the constraints of a computer simulation

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Subject(s): Social Studies and Mathematics

Suggested Grade Level(s): 8 - 12

Time Duration: 5 or more **40-45 minute class periods**

Common Core State Standards Addressed:

- [CCSS.ELA-Literacy.RST.9-10.5](#) Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., *force*, *friction*, *reaction force*, *energy*).
- [CCSS.ELA-Literacy.RST.9-10.8](#) Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem.
- [CCSS.ELA-Literacy.RH.9-10.9](#) Compare and contrast treatments of the same topic in several primary and secondary sources.

Objectives:

- Student will analyze how human actions can deter or contribute to natural disasters.
- Students will synthesize information about various disasters to draw conclusions about human agency with natural hazards.
- Students will design strategies for preventing disaster and apply these strategies in a simulated environment.

Materials:

The Game - <http://www.stopdisastersgame.org/en/home.html>

Various articles on Disasters

1. Article on Floods in Bangladesh

<http://www.theguardian.com/global-development/2013/jan/23/bangladesh-floods-harbingers-disaster>

2. Tsunamis <http://www.livescience.com/13176-history-biggest-tsunamis-earthquakes.html>

3. Google Crisis map for Wildfires in U.S. <http://google.org/crisismap/2013-us-wildfires>

4. Hurricanes National Hurricane center <http://www.nhc.noaa.gov/>

5. Hurricane Katrina at NatGeo
http://news.nationalgeographic.com/news/2005/09/0902_050902_katrina_coverage.html
 6. History of Japan's Major earthquake/tsunami
<http://edition.cnn.com/2013/07/17/world/asia/japan-earthquake---tsunami-fast-facts/>
 9. Wildfire Facts <http://www.dosomething.org/actnow/tipsandtools/11-facts-about-wildfire>

Optional

"Parts of a Game" by the [Institute of Play](#) (attached below): an analysis sheet for breaking down the components of a game.

Activities and Procedures:

Day 1	<p>Taking on the identity and planning</p> <p>"You are part of a global crisis prevention team. You will be trained and dispersed to various countries around the world that face natural disasters. Your goal in each location is to build up resilience – the ability of a community to avert or withstand a natural hazard."</p>				
Day 2	<p>Data gathering and analysis</p> <p>Present information on natural disasters to students using the articles and media in the Materials section.</p> <p>For each disaster have students note down important details to contextualize each disaster and highlight the human components in preventing or worsening the damage. You may use a form like this one to analyze the findings. The goal is to see each disaster in context, but also to use the connections box to relate it to other types of disasters and situations.</p> <table border="1" data-bbox="337 1199 1425 1528"> <tr> <td data-bbox="337 1199 883 1346">Faces</td> <td data-bbox="883 1199 1425 1346">Problems</td> </tr> <tr> <td data-bbox="337 1346 883 1528">Context</td> <td data-bbox="883 1346 1425 1528">Connections</td> </tr> </table> <p><i>Faces</i> - Explain who the stakeholders are. Who are the people who care about this institution or infrastructure that you want to build or improve? Why do they care?</p> <p><i>Problems</i> - Explain in detail what are the problems caused by the current state of this institution or infrastructure. Explain what needs will be met or resolved by your plan.</p> <p><i>Context</i> - When and where is this happening? How is the time and place relevant to this problem? (Think: Would this be a problem in a different location or a different time? Why or why not?)</p> <p><i>Connection</i> - Why do you care? What is in it for you? Who else should care and why?</p>	Faces	Problems	Context	Connections
Faces	Problems				
Context	Connections				

Day 3	<p>Synthesis</p> <p>Explain that while disasters are precipitated by natural events, they always have a human component to their cause. By manipulating the human habitats and actions we can avoid a disastrous collision with forces of nature.</p> <p>Discuss what things you would do differently for each type of disaster to improve resilience in those areas. Remind students that their best laid plans may change when faced with the constraints of Time and Money.</p>
Day 4	<p>Play the Game</p> <p>Stop Disasters - http://www.stopdisastersgame.org/en/home.html</p> <p>Allow students to lose at first. This is a great learning experience. Discuss what went wrong in the game world and how this is similar to the real one.</p> <p>Students may notice that pressures of time and finances lead to some tough decisions.</p> <p>Optional: Use the “Parts of a Game” sheet (attached below) to analyze game mechanics as you play.</p>
Day 5	<p>Play the Game 2</p> <p>As students continue to play the disasters game, notice what strategies in the game world work to prevent disaster and how these are similar to what was gleaned from the articles.</p>

Assessments:

Students will report on their experience by writing a report and submitting images of their game play. The report will show their analysis and synthesis of information about one type of disaster. Their designs will be illustrated by gameplay screenshots. (PrintScreen on PC, Command+Shift+F3 on Mac)

	D	C	B	A
Analyze	Student writing shows attempt at understanding causes of disasters	Student writing shows understanding of some causes of disasters	Student writing shows understanding of various causes of disasters	Student writing shows deep understanding of causes of disasters.
Synthesize	Student writing attempts to interconnect information from more than one source	Student writing synthesizes information from more than one source	Student writing synthesizes information and attempts to show human agency in 'natural disasters'	Student writing synthesizes information from various sources to illustrate the human agency in 'natural disasters'
Design	In gameplay student attempts to avert disasters	In gameplay student attempts to avoid disasters by making changes to communities	In gameplay student avoid disaster by managing resources.	In gameplay student expertly avoids disaster by carefully managing money, time and resources.

Adaptations:

1. You can begin by playing the game from the start and build your lessons as the “need to know arises” When students first play they will inevitably fail and wonder what went wrong. You can take advantage of this game mechanic to then provide teaching and insight into preventing disasters.
2. Focus on one particular type of disaster and use only that portion of the game. You can then provide more focused materials to support student learning, bringing more depth and less breadth to the lesson
3. To deepen the analysis of the game use the attached Parts of a Game worksheet. You can think of the human factors in the disaster as the game mechanics that humans control. This kind of thinking helps focus our attention on the tools and strategies at our disposal instead of the “act of G-d” that we cannot control. (“Parts of a Game” by the [Institute of Play](#) provided below)

Extra Credit/Additional Resources:

1. The Institute of Play (<http://www.instituteofplay.org/>) provides several helpful game analysis tools.
2. More city management games not explicitly tied to disasters can be found at:
 - ElectroCity (<http://www.electrocity.co.nz/Game/game.aspx>): You can make an account and students will be able to submit their cities using a code to you.
 - Epic City Builder (<http://www.a10.com/puzzle-games/sim-city-online>).

“Parts of a Game” from the [Institute of Play](http://www.instituteofplay.org)

www.instituteofplay.org

INSTITUTE of PLAY

PARTS OF A GAME

Goal	<p>What does a player or team have to do to win?</p> <p><i>Ideas</i> ★ Cross the finish line first, collect the most marbles, be the last standing, etc.</p>
Challenge	<p>What obstacles might you put in the player's way to make reaching the goal fun and interesting?</p> <p><i>Ideas</i> ★ How is she being kept from doing it? Her leg is tied to a teammate's, the marbles are hidden, getting hit with a ball ends game play.</p>
Core Mechanics	<p>What core actions or moves does the player do to power the play of the game?</p> <p><i>Ideas</i> ★ Jumping, Wiggling, Searching, Solving Clues, Ducking, Bobbing, Weaving, Dodging</p>
Components	<p>What parts make up the materials of play?</p> <p><i>Ideas</i> ★ Bandanas? A grassy field, marbles, red rubber balls and a court?</p>
Rules	<p>What relationships define what a player can and cannot do in the game?</p> <p><i>Ideas</i> ★ Players' legs are tied together, they must start on the same line, all marbles must be gathered within 3 minutes, balls can only be thrown outside the line towards the midsection.</p>
Mood	<p>What feeling do you want your game to create in players?</p> <p><i>Ideas</i> ★ Breathlessness? Triumph? Reflection? Anxiety?</p>

Sample Components				
DICE	HURDLE	COIN	NET	KEY
SPINNER	TOPHAT	GHOST	TILE	CHAIR
BALL	CAR	POWERPILL	STONE	BARREL
ROPE	MUSHROOM	BAT	WICKET	MUSIC
BASE	CLOUD	STICK	MALLET	REFEREE
				HORSE
				FRISBEE
				JACK
				CHALK
				PENCIL

Core Mechanics				
QUE	ROUND	BEND	PULL	SWIVEL
CLIMB	BALANCE	SHAKE	CRUNCH	RELAX
LIFT	STRETCH	SHIMMY	ROTATE	CONNECT
CRAWL	SPIN	KNEEL	SWING	MARCH
LEAP	LUNGE	PUSH	ROLL	PUMP
				BOW
				RESIST
				DRIFT
				SLIDE
				BOUNCE