

Disastrous Data: We Need a Plan

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Grade Level 6
Duration 1-2 class periods

National Standards

GEOGRAPHY Element 1: The World in Spatial Terms

1. How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information

Element 2: Places and Regions

4. The physical and human characteristics of places

Element 3: Physical Systems

7. The physical processes that shape the patterns of Earth's surface

Element 5: Environment and Society

15. How physical systems affect human systems

Element 6: The Uses of Geography

17. How to apply geography to interpret the past

18. How to apply geography to interpret the present and plan for the future

AZ Standards

ELA

Reading

Integration of Knowledge and Ideas

6.RI.7 Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

Writing

Production and Distribution of Writing

6.W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

MATHEMATICS

Statistics and Probability

6.SP.B.5. Summarize numerical data sets in relation to their context, such as by:

- Reporting the number of observations.
- Describing the nature of the attribute under investigation, including how it was measured and its units of measurement
- Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
- Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

Standards for Mathematical Practice

6.MP.4. Model with mathematics.

Arizona Social Science Standards

GEOGRAPHY

The use of geographic representations and tools helps individuals understand their world.

6.G1.1 Use and construct maps, graphs, and other representations to explain relationships between locations of places and regions.

Examining human population and movement helps individuals understand past, present, and future conditions on Earth's surface.

6.G3.2 Analyze the influence of location, use of natural resources, catastrophic environmental events, and technological developments on human settlement and migration.

Global interconnections and spatial patterns are a necessary part of geographic reasoning.

6.G4.1 Explain why environmental characteristics vary among different world regions.

Overview

A natural hazard takes place in the physical environment and destroys human life, property, or both. Tornadoes, lightning, floods, extreme

temperatures, and earthquakes are some natural hazards that have had disastrous effects on human systems. Analyzing data about such events can help students understand the impact that natural hazards have on human life and the need for a plan of action

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to help prepare the population to better survive disasters.

Purpose

In this lesson students will practice using mean, median, mode, and range to organize and analyze data on the consequences that natural disasters have on human life. Students will formulate ideas to help prepare people for natural hazards and avoid casualties.

Materials

- Calculators (optional)
- Disastrous Flash Floods map
https://geoalliance.asu.edu/sites/default/files/maps/FLASH_FLOOD_FATALITIES2013.pdf
- Disastrous Lightning map
https://geoalliance.asu.edu/sites/default/files/maps/LIGHTNING_FATALITIES2013.pdf
- Disastrous Heat Extremes map
https://geoalliance.asu.edu/sites/default/files/maps/HEAT_FATALITIES2013.pdf
- Disastrous Tornadoes map
https://geoalliance.asu.edu/sites/default/files/maps/TORNADO_FATALITIES2013.pdf
- Disastrous Data worksheets and Answer Key
- Optional: Pictures or video clips of flash floods, lightning, heat extremes, and tornadoes.
- Oral Presentation Form

Objectives

The student will be able to:

1. Calculate mean, median, mode, and range to organize a set of data on deaths caused by natural hazards.
2. Formulate ideas to help prevent deaths caused by these disasters.

Procedures

Prerequisite: Students should have had experience in calculating mean, median, mode, and range.

Note: These maps are from 2013. Before completing the worksheet, students could update the statistics and then complete the assignment. They would then submit the updated map and the worksheet for grading.

SESSION ONE

1. Begin the lesson by writing on board this definition: natural hazard --a process, taking place in the natural environment that destroys human life, property, or both.
2. Draw a four-column chart on the board or use a document camera. Label the first column—Kind of Disaster. Label the second column—Manmade or Natural. Label the third column: Consequences to Humans. Label the fourth column: How Can We Prevent Deaths. Have the class brainstorm what to fill in each column.
3. Divide the class into four groups. Each group will be responsible for one of the following:
 - ✓ -lightning data
 - ✓ -tornado data
 - ✓ -flash flood data
 - ✓ -extreme heat data
4. Distribute one copy of their group's map and enough Disastrous Data worksheets for each group member. Explain the directions and procedures. Provide work time. If students are not finished, this can be homework.

SESSION TWO

1. Give groups about 15 minutes to organize for a oral presentation of data commenting on 4 consequences to humans and 4 ideas on how to prepare for their hazard.
2. As the groups are presenting, fill in the third and four-column chart on the board with any ideas not already recorded there.

Assessment

Mathematics

The Disastrous Data worksheet can be graded. Mastery will be considered a score 80% or higher.

Geography, Reading, and Writing

Each group should be able to come up with 4 consequences to humans and 4 ideas (8 points) during their oral presentations. Groups should have 6 points or higher to be considered mastery.

Extensions

Update these statistics. Students can compare data from different years.

Research information on natural hazards not included in the lesson and their consequences to humans and environments.

Sources

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<https://www.ready.gov/plan>

<http://www.ncdc.noaa.gov/oa/ncdc.html>

<https://www.fema.gov/disaster/4085/updates/fema-kids-know-facts>