

Natural Disasters: Meeting the Challenge

TEACHER'S GUIDE

Geography and social studies expectations require intermediate students to learn about natural disasters: natural hazards, such as earthquakes, that impact humans. As the number of people who are affected by natural disasters increases, students are also learning about how people around the world study natural disasters to prepare for them and minimize their negative impact on people. *Natural Disasters: Meeting the Challenge* is a unique series that focuses on how people learn from natural disasters to prepare for and recover after future disasters.

The *Natural Disasters: Meeting the Challenge* Teacher's Guide includes engaging lessons that help students extend their knowledge about natural disasters and how humans deal with them. Students will describe the causes and effects of natural disasters, and explain how humans have learned from disasters to help mitigate the effects of future disasters. Students will learn about the technologies and plans put in place after disasters and work together to imagine a plan that will help reduce the effects of future disasters. They will have the opportunity to demonstrate their learning in multiple ways.

The integrated lessons in this Teacher's Guide are aimed at grades five to seven, but can be extended to for a grade eight classroom. The lessons can stand alone and serve as ways to extend the content in the series. Reproducible worksheets and assessment tools accompany each lesson. The titles in *Natural Disasters: Meeting the Challenge* include:

Blizzard and Ice Storm Readiness

Earthquake Readiness

Flood Readiness

Heat Wave and Drought Readiness

Hurricane Readiness

Landslide and Avalanche Readiness

Tornado Readiness

Tsunami Readiness

Volcanic Eruption Readiness

Wildfire Readiness

PACING CHART AND VOCABULARY

Lesson Plan Title	Pacing	Vocabulary
Lesson 1: Natural Disaster News Report	4 class periods*	earthquake flood hurricane natural disaster news anchor news report tornado tsunami wildfire
Lesson 2: Why Study Disasters?	2 class periods	earthquake flood hurricane detection forecast mitigate natural disaster technologies tornado tsunami wildfire
Lesson 3: Natural Disaster Task Force	4 class periods	earthquake flood hurricane forecasting global cooperation natural disaster preparation satellite UNEP tornado tsunami wildfire

* 1 class period = 40-60 minutes

ACCOMMODATION STRATEGIES

Accommodations provide equal access to learning and equal opportunity to demonstrate what is learned. Accommodations allow a student access to the subject or course without any changes to the knowledge and skills the student is expected to demonstrate.

Educators are encouraged to adapt the instructional approach, activities, and assessments included in this guide to best meet the diverse interests, needs, and abilities of their students. Possible accommodations may include:

Instructional Strategies

- Break tasks into parts with accompanying time lines
- Provide extra time for processing of oral information.
- Pair oral instructions with visual ones (writing or symbols)
- Pre-teach new vocabulary and regularly review previously taught vocabulary
- Provided model of completed work
- Frequently check with the student to get him/her started
- Provide oral and visual instructions and examples
- Provide a checklist of tasks for the student

Environmental Strategies

- Proximity to teacher
- Strategic seating
- Flexible or mixed-ability grouping
- Provide an alternative setting for learning that is free from visual and auditory distractions.

Assessment Strategies

- Build in extra time to allow student to process questions asked and answers given
- Provide written instructions and rubrics for assignments
- Offer a choice of assessment activities so that the student can choose one suited to their strengths
- Space out or extend assignments to prevent student feeling overwhelmed
- Reduce the number of tasks used to assess skill or concept
- Allow students to use assistive devices or technology

LESSON 1

Natural Disaster News Report

Curriculum Correlations

Common Core State Standards

CCSS.ELA-LITERACY.SL.5.4
CCSS.ELA-LITERACY.SL.5.6
CCSS.ELA-LITERACY.SL.6.6
CCSS.ELA-LITERACY.SL.7.6

Next Generation Science Standards

MS-ESS3-2

Ontario Social Studies Standards

Grade 7: Physical Patterns in a Changing World: A1.1

Ontario Language Arts Curriculum

Grades 5-7 Oral Communication: Overall Expectation 2

Materials

- Natural Disasters: Meeting the Challenge books
- Video projector or Smart Board
- White board and markers
- Chart paper and markers
- *Natural Disaster News Report Assignment Sheet*
- *Natural Disaster News Report Rubric*
- Computers for research

Objectives

Students will be able to:

- Define natural disaster and describe the types of natural disasters, their causes, and their impact on humans.
- Prepare and perform a news report in which they report on a natural disaster to the public, using strong oral communication and media literacy skills.

Setting the Stage

Set the stage and pique interest by showing students a clip of a news report that tells about a natural disaster. The clip can show a disaster that students are familiar with, or one that tells about a different part of the world. Possible clips include:

- Flooding in Ontario: <https://bit.ly/3326luz>
- Tornado outbreak across Midwest: <https://bit.ly/2BUzUl3>
- Holy fire in California: <https://bit.ly/2BUzktR>
- Hurricane Dorian impact in Bahamas: <https://nbcnews.to/2WBj9eN>
- Earthquake in Chile: <https://cbsn.ws/2pqjJj9>
- Tsunami in Indonesia: <https://cbsn.ws/2ozBfRl>
- Blizzard in Newfoundland, Canada: <https://bit.ly/2T4yAdl>
- Volcanic eruption in New Zealand: <https://cbsn.ws/32ase0M>
- Drought in Queensland, Australia: <https://bit.ly/2HDpjnU>
- Landslide in British Columbia, Canada: <https://bit.ly/39Shial>

Talk about the video shown with students. Have they seen any similar news reports (in any format), that they can remember? What do they know about natural disasters and how they impact people?

Define natural disaster: a natural event that impacts people. Write the definition on the board or on a piece of chart paper for students to refer to.

Explain that the human impact is what defines an event as a disaster. Ask students to share what they know about natural disasters, popcorn style. Which natural disasters have they heard about in the news? Which, if any, have impacted them or people they know?

Distribute the books in the Natural Disasters: Meeting the Challenge series. Instruct each group to read Chapter 2 of their book. Each group gets a piece of chart paper and markers. Have each group write the name of the natural disaster at the top of the piece of paper. Then, they need to write five to seven sentences that define their natural disaster, briefly explain its causes, and overview its impact on the natural environment and on humans. Groups can add sketches, numbers, or facts to supplement their information if time remains.

Give each group most of the remaining class period to complete their chart papers. Then, have each group give an informal presentation of the information they found. Hang the pieces of chart paper on a wall in the classroom for students to reference.

Activity

Explain to students that they will use what they have learned to create a news report that informs the public about the natural disaster they focused on. Place students in groups of approximately five. Each group member has a role, and each newscast must include the following:

Two news anchors, who introduce the natural disaster and explain:

- ▶ Where the disaster is happening
- ▶ Who is being impacted

One to two weather forecasters, who explain:

- ▶ The science of the disaster
- ▶ The cause of the disaster

One to two members of the public, who are being impacted by the natural disaster. They are interviewed by the news anchors and through their answers, explain:

- ▶ How the natural disaster is affecting them and others in their community

Hand each group the *Natural Disaster News Report Assignment Sheet*. Each news report should be no longer than five minutes. Review the *Natural Disaster News Report Rubric* so that students understand the expectations.

Give students two periods to prepare their news reports. They should use the *Natural Disasters: Meeting the Challenge* books, and can use computers to conduct additional research.

Extensions

- ▶ Assess students on listening expectations by having them complete a written reflection about the news reports they heard.

Wrap-Up

Teacher can choose or leave it up to students to either record the news report on a video device, or have students present the news reports “live”. Have a period in which students present their news reports.

Assessment

Use the *Natural Resources News Report Rubric* to assess the news reports.

Natural Disaster News Report

A natural disaster has hit, and it is your job to inform the public. With your news team, create a four to five minute news report about the natural disaster. Make sure to research answers and explanations to the questions and statements below. Your news report should show your research. All team members are expected to write the script together. You are being assessed on your performance in the news report.

CHOOSE YOUR ROLES:

- TWO NEWS ANCHORS
- ONE TO TWO NATURAL DISASTER EXPERTS
- ONE TO TWO MEMBERS OF THE PUBLIC

**BREAKING
NEWS**

Your news report must include the following:

1. An introduction by news anchors (*approximately 1 minute*)
 - ▶ Introduce the natural disaster.
 - ▶ Where did it happen? When did it happen? Who is being affected?
2. An expert segment (*approximately 1.5 minutes*)
 - ▶ News anchors will interview a natural disaster expert to learn the science behind the disaster.
 - ▶ Expert must explain the cause of the natural disaster and how the weather grew to turn into the extreme event.
3. An interview with the public (*approximately 1.5 minutes*)
 - ▶ News anchors will interview members of the public who are being affected by the natural disaster.
 - ▶ Members of the public must explain how they are being affected and what it's like in their community right now.
4. A conclusion (*approximately 30 seconds*)
 - ▶ All group members finish the news broadcast by mentioning the major recovery efforts that are to come
 - ▶ Sign off with a unique news station statement (i.e. From the . . ., Until next time . . .)

Student Name: _____ Date: _____

Group Names: _____

Natural Disaster News Report Rubric

	Level 1	Level 2	Level 3	Level 4
Knowledge and Understanding	Student's role may be unclear. Student gives limited relevant information about the natural disaster.	Student identifies their role in the news report and gives some related information about the natural disaster.	Student identifies their role in the news report and gives most related information about the natural disaster.	Student identifies their role in the news report and gives all related information about the natural disaster.
Thinking	Limited or no research about natural disaster and its causes was displayed and explained in the report.	Some research about natural disaster and its causes was displayed and explained in the report.	Student adequately researched the natural disaster and its causes, and mostly explained their research in the report.	Student fully researched the natural disaster and its causes, and clearly explained their research in the report.
Application	Student's effort in producing the news report is unclear or limited. Student's role performance and demonstration of knowledge is lacking.	Student somewhat helped to produce the news report by performing their role and demonstrating their knowledge to a moderate extent.	Student equally helped to produce the news report by performing their role adequately and demonstrating their knowledge.	Student equally helped to produce the news report by performing their role very well, and fully demonstrating their knowledge.
Communication	Student expresses ideas with limited clarity, gives few reasons for their statements, and rarely responds well to group members.	Student expresses ideas with some clarity, gives some reasons for their statements, and sometimes responds well to group members.	Student expresses ideas clearly, usually gives reasons for their statements, and often responds well to group members.	Student expresses ideas clearly, always gives reasons for their statements, and always responds articulately to group members.

Additional Comments

LESSON 2

Why Study Disasters?

Curriculum Correlations

Next Generation Science Standards
MS-ESS3-2

Ontario Social Studies Standards
Grade 7: Physical Patterns in a Changing World: A1.1

Materials

- Natural Disasters: Meeting the Challenge books
- White board and markers
- Photocopies of chosen case study
- Devices for research
- *Studying Natural Disasters Worksheet*
- *Studying Natural Disasters Exit Card*

Objectives

Students will be able to:

- Describe different ways that humans study and learn from natural disasters, and identify strategies and technologies that have been developed after these disasters.
- Explain why it is important that humans study natural disasters—to mitigate their effects on humans in the future.

Setting the Stage

Choose a case study from any book in the Natural Disasters: Meeting the Challenge series. Choose a case study that explains clearly the human impact of the natural disaster, and mentions efforts that were made to learn from the disaster to put future systems in place.

- Suggested case study: “The San Francisco Earthquake of 1906” on page 7 of *Earthquake Readiness*.

Split students into five different groups and provide at least one photocopy of the chosen case study per group. Prior to reading the case study, assign each group a question to answer:

1. What was the human impact of the disaster?
2. What strategies or plans were in place, at the time of the disaster, to minimize its human impact?
3. What efforts were made after the disaster to recover or learn from it?
4. What did people learn about the cause of or science behind the natural disaster?
5. What plans were put in place, or which technologies were developed, after the natural disaster?

Read the case study, or have a student volunteer or volunteers read it. Have each group make jot-notes on their photocopy to briefly answer their question. Read the story again if needed.

Write each of the questions on the white board or chalkboard, with space beneath each question for short notes. Have a volunteer from each group come to the board and write a brief answer to their question. The answer can be in point form—it does not need to be fleshed out. Then, review the questions and answers. Have different group volunteers explain their answers. Talk about how the case study shows an example of how people can learn from natural disasters. Have a discussion about this main idea, asking prompting questions such as:

- Why is it important to study natural disasters?
- What can we learn from them?
- What kinds of natural disaster technologies (related to forecasting, recovery, etc.) can you name?

Activity

Let students know that they will independently read about a natural disaster and how people studied it to learn more and prepare for future disasters.

Each student needs to pick a case study from the Natural Disasters: Meeting the Challenge series. Or, the teacher can allow students to choose a natural disaster that interests them—but they need to run their idea by the teacher.

Using the information in the book, and computers or devices to conduct additional research, students will complete the worksheet *Studying Natural Disasters*. Hand each student the report template to fill in. Let students know that this report is informal—they are not being graded on their writing, but on their understanding of how natural disasters are studied to help humans in the future.

Extensions

- ▶ Using the books, outside research, and the reports created by students, make a class list of technologies that have been developed to help forecast natural disasters, mitigate their effects, and recover from them. As individuals or in pairs (depending on the size of the list), have students choose a technology and create a technology profile. Each profile should explain the function of the technology and give an example of one time it has been used in the real world.
- ▶ Have students research and complete a written response to the question: “How have the lessons learned from past disasters helped mitigate the effects of future disasters?” Students should focus on the natural disaster they studied in this lesson and include an introduction, argument, and evidence to support their argument.

Wrap-Up

Have students pair with a classmate who focused on a different natural disaster than they did. Have students share what they learned about how people learn from natural disasters and use what they learned to prepare for future ones. Ask each student to share something that they learned from their partner.

Hand each student a *Studying Natural Disasters Exit Card*. Students should display what they learned by answering the questions on the exit card.

Assessment

Assess the exit cards for understanding of the science concepts. Give the reports a mark for completion, and examine them to check for any gaps in student understanding.

Name: _____

Date: _____

Studying Natural Disasters

Give some information about the natural disaster you chose.

When and where did it happen?

What was the human impact of the disaster?

What forecasting technologies, mitigation strategies, or recovery plans were in place at the time of the disaster?

Were these strategies effective? Why or why not?

How did people learn from the natural disaster?

What was learned about the cause of or science behind this type of disaster?

What technologies were created as a result of this natural disaster?

What plans or strategies were put in place after this natural disaster?

A large, empty rectangular box with a thin black border, occupying most of the page below the questions. It is intended for the student to write their answers to the four questions listed above.

Name: _____ Date: _____

Studying Natural Disasters Exit Card

Give one example of a technology or plan that was created based on what was learned after a natural disaster.
How does it help reduce the effect of future disasters on humans?

In your own words, why is it important to study natural disasters when they happen?

Name: _____ Date: _____

Studying Natural Disasters Exit Card

Give one example of a technology or plan that was created based on what was learned after a natural disaster.
How does it help reduce the effect of future disasters on humans?

In your own words, why is it important to study natural disasters when they happen?

LESSON 3

Natural Disaster Task Force

Curriculum Correlations

Common Core State Standards

CCSS.ELA-LITERACY.SL.5.4

CCSS.ELA-LITERACY.SL.5.5

Next Generation Science Standards

MS-ESS3-2

Ontario Geography Standards

Grade 7: Physical Patterns in a Changing World: A1.1

Ontario Language Arts Curriculum

Grades 5-7 Media Literacy: Overall expectation 3

Materials

- Natural Disasters: Meeting the Challenge books
- White board and markers or chalkboard and chalk
- Chart paper and markers
- Devices with which students will create media presentations
- *Natural Disaster Task Force Assignment Sheet and Checklist*
- *Natural Disaster Task Force Exit Card*

Setting the Stage

Prior to this lesson, it is best if all students have read the titles in *Natural Disasters: Meeting the Challenge*.

In groups, have students brainstorm all of the forecasting, preparation, plans, and recovery methods and technologies that humans have created after learning from natural disasters. They should use a scrap piece of paper and take five minutes to think of as many examples as they can. Give each group one or more titles from *Natural Disasters: Meeting the Challenge* to look through for ideas.

After brainstorming is finished, have students share their ideas. Go around the room and have one group at a time share one idea. Do not repeat any ideas, and continue until all ideas have been shared. Write the ideas, as they are shared, on the white board or chalkboard, or on a chart piece of paper.

Discuss the solutions that students are familiar with, and those that they need to learn more about. Invite students to share their knowledge and teach each other about the solutions that they are unfamiliar with. Refer back to the books and review the different solutions. Leave the list on the board or on the piece of chart paper for students to refer to during their activity.

Objectives

Students will be able to:

- Apply what they learned about natural disasters, and how people learn from them, to identify the forecasting, preparation, and recovery technologies and methods most likely to reduce the human impact of a disaster.
- Participate on a "task force" to create a plan that mitigates the effect of natural disasters in the future.
- Use media of choice to present natural disaster plan to peers.

Activity

Pose the following scenario to students. Engage students by playing a role, such as a member of the UN Environment Programme (UNEP).

A task force has been assembled to face natural disasters around the world, so that we can reduce the impact that these disasters have on humans.

Have students form groups of four or five. Each group gets a title from *Natural Disasters: Meeting the Challenge* and devices for research. Each group focuses on a different natural disaster, indicated by the title they were given: hurricane, tornado, wildfire, tsunami, earthquake, flood.

Hand each group the *Natural Disaster Task Force Assignment Sheet*. They will create a short media presentation to show their idea for a plan to face future natural disasters. Their plan needs to include the following elements, and be focused on global cooperation. How will countries work together to complete this plan? Each plan includes:

- Forecasting
- Preparation
- Actions needed during disaster
- Recovery

Give students approximately three periods to complete their media presentation. They can choose which format to use for their presentation. Options can include a brochure, poster, prezi, power point, video, infographic, etc.

Extensions

- ▶ Have students write a reflection piece about their assignment.
- ▶ Have students consider how they, in their communities, can either create a natural disaster action plan or contribute to a global cause, such as reducing their impact on the environment or raising awareness about natural disaster preparedness.

Wrap-Up

Have a presentation day in which students present their ideas. Have a gallery walk, use the bansho method, or have groups show their media pieces one after another.

Give each student a *Natural Disasters Task Force Exit Card* prior to the presentations. They need to write down one new idea they learned from one of the other presentations.

Assessment

Assess the exit cards for completion, science standards, and speaking and listening standards. Assess the media presentations with the *Natural Disasters Task Force Checklist*.

Name: _____ Date: _____

Natural Disaster Task Force Assignment Sheet

Natural disasters are weather events that become disasters when they affect humans. But humans can take action to meet the challenge of natural disasters, and reduce their impact. And the world needs your help!

With the other members of your task force, create a plan to meet the challenge of a natural disaster. You will create a media presentation to share your plan. Your media presentation will:

- Explain the effects of the natural disaster
- Explain your plan to meet the challenge of the disaster and reduce its effects on people

Your plan must include:

- Forecasting
- Preparing
- Action plan during the disaster
- Recovery

Review the assessment checklist below to see how your media presentation will be assessed.

Natural Disaster Task Force Checklist

Criteria	Level 1 (Did not meet expectations)	Level 2 (Approaching expectations)	Level 3 (Met expectations)	Level 4 (Exceeded expectations)
Effects of natural disaster were identified				
Plan for tackling natural disaster includes forecasting, preparation, action plans, and recovery strategies				
Media presentation represents plan clearly, and in an engaging way				

Additional comments:

Name: _____ Date: _____

Natural Disaster Task Force Exit Card

Describe something new that you learned from another group's presentation. Explain how their idea helps humans around the world meet the challenge of natural disasters.

Name: _____ Date: _____

Studying Natural Disasters Exit Card

Describe something new that you learned from another group's presentation. Explain how their idea helps humans around the world meet the challenge of natural disasters.