



Topic Guide

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**Note to Parents,
Coaches, and Mentors:**

Some scenarios described in these resources might not be appropriate for very young teams. Always review resource materials before presenting them to your team.

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Resources

Prepare | Stay Safe | Rebuild

This document provides some resources to help start your Nature's Fury Project research. Do not limit yourselves to these websites and books, though. Remember that your library, local hospital, school, local government, historical society, aid association, and area health and social workers, physicians, working scientists, and engineers also can be great resources for your team. Most countries have a weather service or agency in charge of disasters. Your state, province, county, or town probably has its own Emergency Management Department. They may be able to provide you with information about the type of disasters that happen in your area and how to prepare.

Web Resources

Some of these resources are websites that were designed for adults, so don't be afraid to ask a coach or mentor for some vocabulary help.

Forces of Nature

ESA Kids Earth Natural Disasters

<http://www.esa.int/esaKIDSen/Naturaldisasters.html>

The European Space Agency provides child-friendly information about technology and how it is used in case of earthquakes, floods, forest fires, and volcanic eruptions. Also included are activities and quizzes.

Weather Wiz Kids

<http://www.weatherwizkids.com/>

Basic information on a variety of natural disasters (including non-weather) written for kids.

National Geographic Natural Disasters

<http://environment.nationalgeographic.com/environment/natural-disasters/>

Imagery, articles, games, and video on a variety of natural disasters.

U.S. National Oceanic and Atmospheric Administration (NOAA)

http://www.education.noaa.gov/Special_Topics/FLL_Natures_Fury.html

A list of links to help you find more information about a variety of forces of nature.

<http://www.nssl.noaa.gov/primer/>

The National Severe Storms Laboratory provides answers to common questions about forces of nature such as storms and floods.

Natural Disaster Planning

Stop Disasters! Game

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

Disaster simulation game from the United Nations International Strategy for Disaster Reduction.

Includes tips on reducing damage from five different forces of nature.



US Federal Emergency Management Agency: Flat Stanley and Flat Stella Blog

<http://www.fema.gov/blog/Stanley%20and%20Stella>

Child-friendly information about emergency management offices, community volunteers, disaster assistance, disaster operation agencies, preparing for disasters, and more...

Ready Kids

<http://www.ready.gov/kids/>

Learn about disaster planning through facts, games, and exercises. Presented by the U.S. Federal Emergency Management Agency (FEMA).

American Red Cross by Disaster or Emergency

<http://www.redcross.org/prepare/disaster>

Includes descriptions of a variety of natural disasters along with information about planning for, responding during, and recovering after natural disasters strike. Includes brief descriptions of warnings and links to safety checklists. Many available in English and Spanish.

The Weather Channel: Safety and Preparedness

<http://www.weather.com/life/safety/>

Family oriented information about natural disaster safety and preparedness.

Forest Fire Unit

<http://education.mit.edu/starlogo-tng/learn/forest-fire-unit>

Game and curriculum that teaches about forest fires (from Massachusetts Institute of Technology).

Careers

Careers in the Science of Disasters

http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2005_08_12/noDOI.4582097086945489205

Meet several scientists with fascinating careers and career plans: a technologist working on earthquake-monitoring systems, an epidemiologist investigating the post-disaster mitigation, and an engineer working on making the built environment more resilient.

FirstResponder.gov

<http://www.firstresponder.gov/>

Information from the US Department of Homeland Security about careers as first responders in emergency medical services, fire fighting, hazmat, explosives, law enforcement, and search and rescue; preparedness and training; reports and industry newsletters, current technology and standards, and emergency management.

The University of Edinburgh Career Service: Coastguard and Mountain Rescue Service

<http://www.ed.ac.uk/schools-departments/careers/explore/occupations/defence/coastguard-mountain>

Information about careers in rescue services with links to UK services.



Print Resources

Witness to Disaster Series

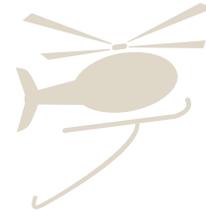
The National Geographic Society

Earthquakes by Judy and Dennis Fradin (2008)

Hurricanes by Judy and Dennis Fradin (2007)

Tsunamis by Judy and Dennis Fradin (2008)

Volcanoes by Judy and Dennis Fradin (2007)



Inside Series

Sterling Publishing Co., Inc.

Inside Hurricanes by Mary Kay Carson (2010)

Inside Tornadoes by Mary Kay Carson (2010)

Inside Earthquakes by Melissa Stewart (2011)

Inside Volcanoes by Melissa Stewart (2011)

Inside Lightning by Melissa Stewart (2011)

Natural Disasters in Action Series

Rosen Central (2008)

Earthquakes in Action by Ewan McLeish

Floods in Action by Chris Oxlade

Landslides and Avalanches in Action by Louise and Richard Spilsbury

Tsunamis in Action by Louise and Richard Spilsbury

Volcanoes in Action by Anita Ganeri

Wildfire by Taylor Morrison

Houghton Mifflin Books for Children (2006)

Blinding Blizzards by Michael Portman

Gareth Stevens Publishing (2012)

Disaster!: A History of Earthquakes, Floods, Plagues, and Other Catastrophes by John Withington

DK Children (2010)

Careers As A First Responder (Essential Careers) by Gina Hagler

Rosen Publishing Group (2012)

Disaster Planning (At Issue Series) by Janel D. Morris

Greenhaven (2008)

The Unthinkable: Who Survives When Disaster Strikes and Why by Amanda Ripley

Crown Publishers (2008)

Note: *The Unthinkable* contains some scenario descriptions that might not be appropriate for young teams.

Staying Alive in Avalanche Terrain by Bruce Tremper

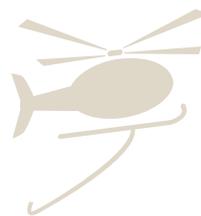
Mountaineers Books (2008)

Ask a Professional

Prepare | Stay Safe | Rebuild

Talking with professionals (people who prepare for, work during, and rebuild after natural disasters) is a great way for your FLL team to:

- Learn more about this season's topic
- Find current data
- Discover potential problems
- Learn what is being done about those problems
- Get feedback on your innovative solution



Who Do You Know?

One of the best research tools for your project is your own team. Think about it. Who do you know? Chances are you know a professional who works with natural disasters in some way. Chances are that a professional can answer your questions about the natural event you chose, the way emergency plans are prepared and put into action, or the efforts required to rebuild after the event has passed.

Think about the technology that allows people to study natural events, predict when they might happen, predict the risk of harm to people and property. Think about the people who work at jobs creating and maintaining that technology. Do you know a scientist, emergency manager, city planner, or meteorologist? Think about people who work during natural disasters. Do you know a first responder? Think about the people who work to clean-up and rebuild after a natural disaster strikes. Do you know someone who has volunteered to help with rescue, shelter, and clean-up when a natural disaster happened in the past? Do you know a building inspector, architect, civil engineer, building contractor, or construction worker? All of those jobs have workers who play a part in being prepared, staying safe, and rebuilding. Make a list.

How Should You Ask?

Next, ask your coach to help you contact the professional your team selected for interview. You can make contact by telephone, email message, or letter. Explain a little about FLL. Briefly explain what you are researching this season. Finally, tell the professional about your goals and ask for the interview. Make sure you choose a day when your coach, mentor, or another adult is available to attend, too.

What Should You Ask?

Your team should do some research before you interview any professional. Advance research will help everyone on your team decide what you want to ask and will help you learn more from the interview. Keep your Project and interview goals in mind. Keep your questions short and to-the-point. Do NOT ask your professional to solve the problem your team chose. Your team's solution must be the work of team members. The professional can

help your team learn about the topic or provide feedback after your team has chosen a solution.

It is easy to lose track of time when you're learning about something really interesting. Decide who will be responsible for politely telling the rest of the team when the interview time is coming to an end. Exhibit Gracious Professionalism® during your interview. Thank the professional for his or her contribution!

At the end of the interview, remember to ask the professional if your team may contact them again. You might think of more questions later. Find out if your professional would be willing to answer more questions by telephone or email. Maybe they will be willing to meet with your team again or give you a tour of their workplace. Do not be afraid to ask.

Who Can You Ask?

Your team might consider contacting people who work in the following professions as you search for professionals to help you with your project. You probably know people who work in other jobs who could help before, during, or after a natural disaster. Remember to check your own list! Many corporate, professional association, government, and university websites include contact information for professionals.

Profession	What they do	Where they work
Architect	Designs buildings, bridges, and other large structures. Also works with contractors to make sure that the structures are constructed the way they were designed.	Private companies, large construction companies, government agencies
Building inspector	Verifies that plans for the construction or repair of buildings meet standards and regulations. Makes sure that the new and renovated structures are built the way they were designed. Assesses damage and specifies minimum repairs.	Government agencies, large construction companies
Cartographer	Measures, analyzes, and interprets geographic and other information to create risk, evacuation, natural event progress, damage, clean-up, and rebuilding maps	Private companies, government agencies, universities and research facilities
City planner	Works to control of the use of land and the design of the environment, including providing transportation networks and protection from the risks of harm from natural events, to guide and ensure the orderly development of settlements and communities.	Private companies, government agencies universities and research facilities
Civil engineer	Designs and maintains buildings, bridges, utility systems, and other large structures.	Private companies, government agencies, universities and research facilities
Emergency manager	Designs and implements processes used to protect people, property, or organizations from the consequences of disasters. Coordinates warning, evacuation, and rescue efforts. Coordinates victim shelter and care. Coordinates clean-up and rebuilding efforts.	Private companies, government agencies universities and research facilities

Profession	What they do	Where they work
Emergency medical technician (EMT)	Assesses a patient's condition and performs emergency medical procedures, as needed, until the patient can be transferred to an appropriate destination for advanced medical care.	Ambulance services (paid or voluntary), rescue teams/squads, the military, or a fire or police department.
Firefighter	Extinguishes fires that threaten property and civilian or natural populations and rescues people from dangerous situations, such as collapsed or burning buildings.	Fire services, fire and rescue services, fire brigades or fire departments, the military, government agencies, private companies, universities and research facilities
Geologist	Studies the earth's crust and the way its layers were formed.	Government agencies, private companies, universities and research facilities
Geophysicist	Uses gravity, magnetic, electrical, and seismic methods to study the internal structure and evolution of the earth, earthquakes, the ocean, and other physical features.	Government agencies, private companies, universities and research facilities
Mechanical engineer	Designs and maintains test instruments, rescue equipment, emergency medical equipment, heating and cooling facilities, temporary shelter.	Private companies, government agencies, scientific instrument manufacturers, universities and research facilities
Meteorologist	Studies weather, climate, and the earth's atmosphere; issues predictions and warnings.	Private companies, government agencies, universities and research facilities
Police officer	Assists with evacuation notices, evacuations, rescues, and protecting people and property.	Government agencies
Physician	Helps people who may become sick or hurt during a disaster.	Physician's offices, hospitals, clinics, assisted living facilities, nursing homes, long-term care facilities, universities and research facilities, government agencies
Programmer/ Software engineer	Designs and maintains computer, scientific instrument, factory-automation, materials and personnel tracking, and other software used to monitor natural events, provides communications, provides at-risk and evacuation area maps, monitor rescue and rebuilding efforts.	Universities and research facilities, government agencies, private companies, factory automation manufacturers, scientific instrument manufacturers, computer hardware and software manufacturers
Rescue worker	Locates victims, assesses injuries, administers emergency medical care, and extricates trapped individuals. Transports injured or sick persons to medical facilities.	Private companies, government agencies
Robotics engineer	Designs and maintains test instruments, search and rescue equipment, and other medical and assistive devices	Government agencies, scientific instrument manufacturers, computer manufacturers, universities and research facilities



Profession	What they do	Where they work
Seismologist	Studies earthquakes and the structure of the earth, by both naturally and artificially generated seismic waves.	Government agencies, private companies, universities and research facilities
Volcanist	Also known as a volcanologist. Observes volcanic eruptions, collects eruptive products including tephra (such as ash or pumice), rock, and lava samples.	Government agencies, universities and research facilities





Glossary

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Here you will find a list of terms that relate to natural disasters along with their meanings. Some you will find in your Project materials. Some you will come across as you research the challenges identified by your research and your team's innovative solution. Remember to ask your coach or another adult for help with any new words from your research.

Term	Definition
architect	A person who designs buildings, bridges, and other large structures. An architect also works with builders to make sure that the buildings are constructed the way they were designed.
avalanche	A large mass of snow, ice, and rocks sliding swiftly down a mountain.
building inspector	A person, often a government employee, who verifies that the plans for the construction or repair of permanent structures meet standards and regulations. They make sure that the new and renovated structures are built the way they were designed. Building inspectors might also assess damage to structures and determine the minimum repairs required to restore the safety of a damaged building, bridge, dam, tunnel, dock, breakwater.
blizzard	A heavy snowstorm with very strong, cold winds.
cartographer	A person who measures, analyzes, and interprets geographic information to create maps and charts for political, cultural, educational, and other purposes. Cartographers are general mapmakers, and photogrammetrists are specialized mapmakers who use aerial photographs to create maps.
city planner	A professional who works to control of the use of land and the design of the environment, including providing transportation networks and protection from the risks of harm from natural events, to guide and ensure the orderly development of settlements and communities.
cyclone	A storm with strong winds that move around a center of low pressure.
earthquake	A movement of the ground that feels like strong shaking or trembling. It is caused by shifts in rock underground or by the action of a volcano.
emergency manager	A professional who deals with the processes used to protect people, property, or organizations from the consequences of disasters.
engineer	Someone who uses science to create new things that people can use. Engineers create things like bridges, roads, computers, telescopes, tractors, airplanes, medical machines and tools, test instruments, and many others.
first responder	A trained professional who provides emergency medical, fire, hazardous materials (hazmat), explosive materials, law enforcement, or search and rescue services during and immediately following a disaster.

Term	Definition
flood	A great overflow of water onto a place that is usually dry.
forces of nature	Wind, rain, snow, hail, lightning, gravity, seismic or volcanic activity.
geologist	A specialist in the science that deals with the history of the earth and its life especially as recorded in the rocks.
geophysicist	A specialist in the physics of the earth including the fields of meteorology, hydrology, oceanography, seismology, volcanology, magnetism, radioactivity, and geodesy.
hurricane	A very strong windstorm, often with heavy rain, in which the wind blows in a circle at 73 or more miles per hour. Hurricanes usually start in the Caribbean Sea and move northward.
landslide	A great mass of rocks and earth sliding down the side of a hill or mountain.
meteorologist	An expert in the science that studies weather, climate, and the earth's atmosphere.
natural disaster	Something that happens when a force of nature becomes so powerful that property could be damaged or people could be at risk of harm.
natural event	An event caused by nature, such as wind, rain, snow, hail, lightning, gravity, seismic or volcanic activity. Not all natural events cause a natural disaster. For example, a hurricane that remains at sea and does not damage property or harm people is a natural event — but not a natural disaster. For the purpose of this project, consider only these natural events: avalanche or landslide, earthquake, flood, hurricane, storm (wind, sand, blizzard, or rain), tornado or cyclone, tsunami, volcanic eruption, and wildfire (not started by people).
rescue worker	Someone who works to bring people out of danger, attack, or harm, especially after a disaster or accident. Examples of rescue workers include police officers, firefighters, emergency medical technicians (EMTs), paramedics, and search and rescue (SAR) personnel.
safe	Free from harm or danger.
seismologist	Also known as a seismographer. A geophysicist who specializes in the art of registering the shocks and movements of earthquakes.
storm	A strong wind along with heavy rain, snow, sleet, or hail. A storm often includes thunder and lightning.
tsunami	Also known as a tidal wave. A natural event that occurs when a great sea wave is produced by submarine earth movement or a volcanic eruption. Ninety percent of all tsunamis are generated by earthquakes.
volcanic eruption	A natural event that occurs when melted rock from deep inside the earth is thrown up to the surface.
volcanologist	A person who studies the formation of volcanoes and their current and historic eruptions.
wildfire	A fire that burns, often uncontrollably, over a large area of undeveloped land and spreads to threaten people and property in developed areas.