Natural hazards exist all over Europe. Use this map to find out which kinds of hazards to prepare for where you live.

The Pillowcase Project
redcross.org/pillowcase

Wherever you live, you should be prepared for these common emergencies:

**Home Fires**
Home fires happen every day. Be prepared with working smoke alarms and a home escape plan.

**Flooding**
Too much rain or melted snow can cause any river or stream to overflow, flooding nearby roads and towns.

**Thunderstorms & Lightning**
Thunderstorms cause thousands of lightning strikes across Europe every day. They can happen anywhere, at any time.

**Tornadoes**
Tornadoes occur in all parts of Europe, at all times of the year.
Activity 1  
The Science of Safety • Reproducible Master  
Storm Watch

Can you tell the difference between a hurricane and a tornado? Both are storms that spin around in a circle – what weather forecasters call cyclones. And both can destroy whole communities with their strong winds. So what makes them different?

Get together with a small group of classmates to answer that question. Your teacher will have your group gather information about hurricanes or tornadoes. Use the research guide below to organize what you discover. Then present your findings in a class discussion. By working together, you’ll learn the difference between hurricanes and tornadoes, and how to stay safe when these two different kinds of storms happen.

**Our Research Topic:** Hurricanes or Tornadoes

**Where the storms happen**

Use the Harrisad Map to plot out where your type of storm is most likely to happen in the United States. You can also use the online map at maps.redcross.org/visitloc/maps/AIC_Map_Links.html. Mark the locations on this map.

**How the storms happen**


**How to stay safe**

What should you do if a hurricane or tornado is headed your way? Are there different safety precautions for these two kinds of storms? Visit redcross.org/prepare/disaster and click on Hurricane or Tornado. Use the space or a separate sheet of paper to write down the safety facts you plan to share with your classmates.

Plan how your group will present what you have learned to the class. You might want to use pictures or videos that you have found on the Internet, or create your own diagrams and charts to explain your kind of cycle and how to stay safe when one happens.

Activity 2  
The Science of Safety • Reproducible Master  
On the Edge

Look for earthquakes and volcanoes on the Harrisad Map poster. You’ll see, for example, that in the United States both happen along the Pacific Ocean. Why?

**Tectonic Plates**

Geologists are scientists who study how Earth is put together. Together, they have discovered that the surface of the Earth is made up of gigantic slabs of rock, called tectonic plates, that fit together like the pieces of a puzzle. As you can see in the United States, the North Pacific Plate is part of the North Pacific Plate, but the North American Plate happens up against the Pacific Plate along the west coast. That’s one area where earthquakes and volcanoes can happen.

Unlike the pieces of a puzzle, tectonic plates move and shift position, and that causes the edges of the plates to be pushed together or pulled apart. This usually happens so slowly that we don’t feel it, but when the edges get caught in each other pressures build up at that spot until, one day, the two edges break free. When that happens, we feel an earthquake.

**Magma**

The rock underneath the tectonic plates is very hot – so hot that it has melted into a thick fluid called magma. In some places, the magma pushes up through the surface of the Earth, and that’s the start of a volcano. A volcano is a mountain that has been built up by magma flowing to the surface of the Earth, where it hardens into solid rock.

As you have probably figured out, the cracks between the tectonic plates make good places for magma to find a path to the surface. That’s why most of the world’s volcanoes are located along the edges of tectonic plates. But sometimes the magma finds a soft spot away from the edges where it can push through. That’s how the Hawaiian Islands were formed in the middle of the Pacific Plate – they are actually the tops of volcanoes that built up from the bottom of the ocean.

**Show What You Know**

Can you think of a way to show how an earthquake or a volcano happens?

• Start by thinking about what you could use to show how gigantic slabs of rock push together and then slip against one another to cause an earthquake. Could you show what happens with blocks? Clay? Sponges?

• Or start by thinking about what you could use to show how magma pushes up through the surface of the Earth to make a volcano. Could you show what happens with power lines, breaks water and gas pipes?

Use the back of this sheet or draw how you would show a model to make a show or an earthquake or a volcano happens. To learn more, you can visit Earthquakes for Kids at earthquake.usgs.gov/learn/kids/ or Volcano Hazards at volcanoes.usgs.gov/index.html. After you have drawn your model, get together with some classmates who have come up with the best ideas for a model and decide on the best way to make your model. Then work together as a team to make a model that you can share with the whole class.

**Earthquake and Volcano Safety**

Visit the American Red Cross website to find out how to stay safe during an earthquake or when a volcano is ready to erupt. Go to redcross.org/prep/disaster and click on Earthquake and Volcano. Learn how to “Drop, Cover, and Hold On” when an earthquake happens, and practice the safety drill in class. If you live near a volcano, ask your teacher to tell you about your town’s plan to get everyone far away if the volcano erupts.

Activity 3  
The Science of Safety • Reproducible Master  
Designed for Safety

We build resilience through wise decisions on how we use land as well as how we engineer structures. Hurricanes, tornadoes, volcanoes, and earthquakes are all natural hazards. We can’t stop them from happening. We can, however, stop some natural hazards from causing as much damage, if we can improve existing ideas or find new and innovative ways to build homes and cities.

Here are some ideas that engineers have come up with to help protect people from the damage caused by hurricanes, tornadoes, and earthquakes.

**Target Audience**

This small-group activity guides students to the science of volcanic eruptions and explains how the movement of tectonic plates creates the conditions necessary for volcanic activity. Students then conceptualize a very basic model that shows how these geological forces at work and use it to create a working model to share with the class.

**Activity 2: On the Edge**

This activity introduces students to the science of plate tectonics and explains how the movement of tectonic plates creates the conditions necessary for volcanic activity. Students then conceptualize a very basic model that shows how these geological forces at work and use it to create a working model to share with the class.

**Activity 3: Designed for Safety**

This activity challenges students to come up with engineering ideas that could reduce the damage to homes and cities caused by hurricanes, tornadoes, and earthquakes. The activity sheet briefly reviews some design concepts that engineers have explored already. For added inspiration, take students to http://webecool.monticola.com/2011/04/22/diastro-proof-architecture-13-super-strong-structures.

**Using the Program Components**

• Make copies of the activity sheets for all of your students. Provide master copies of the program to other teachers in your school.

• Use the Harrisad Map poster to introduce students to some of the natural hazards that occur in the United States. Point out the hazards common to your region and talk about hazards where your students have relatives and friends. Explain that students will be learning about four natural hazards – tornadoes, volcanoes, and earthquakes – and how to stay safe when these hazards cause emergencies.

**Activity 1: Storm Watch**

The small group activity guides students through a collaborative research project using a variety of online resources (websites, maps, animations, and videos). Assign some groups to research hurricanes and others to research tornadoes. When they have completed their research, have each group report its findings in a class discussion. Use a chalkboard, whiteboard, or butcher paper to create a chart comparing the location, causes, and safety facts for these two types of violent storms. (Note: You can find other hazards in your state or region and use the Harrisad Map to create a model of that hazard for your students to present to the class.)

**Emergency Preparedness**

Conclude the program by reviewing the emergency preparedness information presented in the activity sheet about the National Science Foundation’s Red Cross initiative that aims to bring emergency preparedness education to every community in the United States.

The Pillowcase Project

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