



0. EARTHQUAKES - Story Preface

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What to do if an earthquake suddenly strikes? The USGS (U.S. Geological Survey) recommends: "Drop! Cover! Hold On!" Image online, courtesy USGS. PD

Although [earthquakes happen](#) all the time, we only hear about the massive or damaging ones. But the USGS (United States Geological Survey) creates [hourly maps](#) which locate "felt quakes" in the U.S. and throughout the world.

It's surprising to realize how many earthquakes measured at least 5.5 on the Richter Scale during the past five years.

The USGS encourages people to [report](#) earthquake tremors (or "[tremblors](#)" as they are typically called). Such events can even [predict](#) volcanic eruptions - just like tremors in 79 AD (had they been understood) could have predicted the eruption of Mt. Vesuvius which destroyed [Pompeii](#) and Herculaneum.

Why do earthquakes happen? The [process](#) (don't miss this animation) has everything to do with how the earth is constructed. Tectonic plates, for example, sometimes "grind" against each other. Those [movements](#) can dislocate segments of the Earth's crust and is one cause of earthquakes:

An earthquake is the vibration, sometimes violent, of the Earth's surface that follows a release of energy in the Earth's crust. This energy can be generated by a sudden dislocation of segments of the crust, by a volcanic eruption, or event by manmade explosions. Most destructive quakes, however, are caused by dislocations of the crust. The crust may first bend and then, when the stress exceeds the strength of the rocks, break and "snap" to a new position.

In the process of breaking, vibrations called "seismic waves" are generated. These waves travel outward from the source of the earthquake along the surface and through the Earth at varying speeds depending on the material through which they move. Some of the vibrations are of high enough frequency to be audible, while others are of very low frequency. These vibrations cause the entire planet to quiver or ring like a bell or tuning fork.

Earthquakes typically [occur](#) (another helpful animation) along a "fault line" which is, in essence, a [fracture](#) of the Earth's crust. Italy has two main fault lines - that is, two main cracks in the Earth's surface - which cut across the country.

One Italian fault line runs north and south, along the [spine](#) of the [Apennine mountains](#). The [medieval town](#) of L'Aquila (meaning "Eagle," in English) and its [neighboring villages](#), are [situated](#) in a valley in the central Apennines. Another [fault line](#) (south of Rome and north of Naples) crosses the country, east-west.

The crack along the Apennines is the reason why L'Aquila (and twenty-five additional towns and [villages](#)) suffered a [major earthquake](#) on the 6th of April, 2009. That same fault led to [another deadly quake](#) on the [24th of August, 2016](#) - with a magnitude of 6.2 - when [the towns](#) of Accumoli and Arquata del Tronto were damaged, Amatrice was reduced to rubble and the village of Pescara del Tronto was completely levelled.

The USGS tells us that the 2009 and 2016 quakes are likely related:

The preliminary location of the 2016 earthquake appears to be in a gap between the aftershock sequences of the 1997 and 2009 events.

The [August 24th quake](#) - which occurred on the anniversary of the Vesuvius eruption, in 79 AD, that [destroyed Pompeii and Herculaneum](#) - was felt, in varying degrees, from Bologna (in the north) to Naples (in the South). Even some buildings in Rome shook for twenty seconds (as depicted in this "[shake map](#)").

In the United States, the [San Andreas Fault](#) (located in Central California's Carrizo Plain) is the most famous. It has been the [source](#) of California's [worst earthquakes](#) (including the 6.9 magnitude Loma Prieta quake which

disrupted the World Series on October 17, 1989, causing massive damage in the San Francisco area).

Scientists believe the North American plate (where San Francisco is located) moves generally south while the Pacific plate (where Los Angeles is found) moves generally north. The San Andreas Fault is the boundary between these two plates. Earthquakes can occur along a "strike-slip fault" (like the San Andreas) when tectonic plates "slide past" each other.

On the morning of April 18, 1906, there was significant slippage between the North American and Pacific plates, causing the earth's crust along the San Andreas fault to move (at its peak) about 20 feet (6 meters). San Francisco was nearly destroyed, and more than half of its residents (250,000 out of 400,000) became homeless.

See [Alignments to State and Common Core standards for this story online at:](#)

<http://www.awesomestories.com/asset/AcademicAlignment/EARTHQUAKES-San-Francisco-Earthquake-of-1906>

See [Learning Tasks for this story online at:](#)

<http://www.awesomestories.com/asset/AcademicActivities/EARTHQUAKES-San-Francisco-Earthquake-of-1906>

Media Stream



Apennine Mountains - Location in Italy

Map image online, courtesy [StudentBritannica.com](#)

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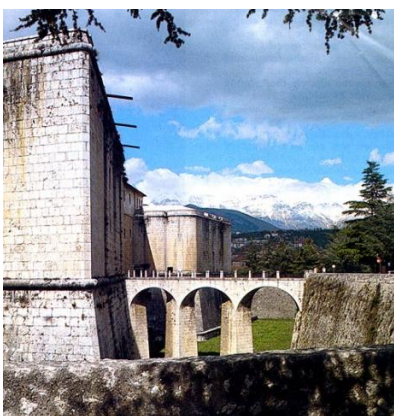


Scene in the Apennine Mountains

Image online, courtesy Wikimedia Commons. PD

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L'Aquila - A Medieval Town

Image online, courtesy Wikimedia Commons. PD

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Santo Stefano di Sessanio - Medieval Italy

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Location of L'Aquila - Central Italy

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Map Detailing California Earthquakes

Illustration online, courtesy USGS. PD

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San Andreas Fault Boundry Lines

Image online, courtesy U.S. Geological Survey (USGS). PD

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