



Nuclear Testing 101

What is a nuclear test?

Nuclear tests are generally controlled explosions of nuclear devices, such as bombs or warheads. The tests are used to determine a device's effectiveness, yield (amount of energy released during detonation) and explosive capability. There are four types of nuclear tests:

1. Atmospheric tests occur in or above the atmosphere.
2. Underground tests occur below the Earth's surface.
3. Upper atmospheric tests occur more than 30 kilometers off the ground.
4. Underwater tests occur under water or close to the surface.

Do nuclear tests cause radiation exposure?

Nuclear tests that occur above ground or under water would likely cause radiation to their immediate vicinity. If devices are buried far enough underground, a nuclear explosion may be contained to prevent the release of radiation into the atmosphere. However, if a device is not buried deeply enough, the explosion could cause the ground around it to explode, which would result in the release of radiation.

How do we know when a test occurs?

Nuclear devices release a large amount of energy when they are detonated. That release of energy can register as seismic activity, similar to earthquakes. There is a network of seismic sensors in place globally that has successfully detected every nuclear test since its activation.

For example, North Korea conducted its last nuclear test in 2017. The underground test was near North Korea's known Pyunggye-ri test site and registered a 6.3 magnitude seismic event, according to the United States Geological Survey.

How do nuclear tests affect countries in a small geographic area?

The risks to other areas in the vicinity of a nuclear test are largely driven by the type of test being conducted. Atmospheric and underwater tests could lead to contamination of air and water. The biggest risk to areas in the immediate vicinity of an underground nuclear test is potential seismic activity, although there has been no documented case of a nuclear test causing an earthquake.

Generally, nuclear test sites are located far from major population centers for that reason. For example, North Korea's Punggye-ri nuclear test site is more than 232 miles from Pyongyang and more than 280 miles from Seoul. Interestingly, it is less than 50 miles from the North Korean city of Chongjin which reportedly has a population of over 600,000.

How many nuclear tests have there been?

Since 1945, more than 2,000 nuclear tests have been conducted worldwide. Below is a breakdown of the number of tests performed by each nuclear-armed state:

<i>Country</i>	<i>Number of Tests</i>	<i>Most Recent Test</i>
United States	1,032	September 23, 1992
Soviet Union	715	October 24, 1990
France	210	January 27, 1996
United Kingdom	45	November 26, 1991
China	45	July 29, 1996
India	3	May 13, 1998
Pakistan	2	May 30, 1998
North Korea	6	September 3, 2017

In recent years, nuclear testing has significantly decreased, with North Korea being the only country to have conducted explosive tests in the 21st century.