

What happens when a nuclear bomb explodes?

BLAST DAMAGE

The degree of damage depends upon the distance from the center of the bomb blast, or ground zero. Heat, pressure and bomb debris that falls back to the ground cause the major immediate damage. At ground zero, the high temperature immediately vaporizes everything. A large nuclear bomb could level buildings five or six miles from the hypocenter. Huge firestorms with gale force winds develop shortly after the blast.

Beyond the immediate blast area, casualties are caused by heat, radiation and fires. A large bomb could cause fires for 25 miles from the hypocenter, and burns to humans and animals for more than 50 miles.

ELECTROMAGNETIC PULSE

A nuclear bomb explosion creates an electromagnetic pulse that causes metal cables to act as antennae and generate high voltages when the pulse passes. Such high currents destroy electronics and even the wires themselves. The largest-yield nuclear devices are designed to destroy communication systems. An airburst at the right altitude could produce continent-wide effects.

“There is no doubt that, if the peoples of the world were more fully aware of the inherent danger of nuclear weapons and the consequences of their use, they would reject them, and not permit their continued possession or acquisition on their behalf by their governments, even for an alleged need for self-defense.”

—Canberra Commission on the Elimination of Nuclear Weapons

FALLOUT

Local effects of a nuclear explosion include large amounts of earth or water that are vaporized by the heat of the fireball and drawn up into a radioactive cloud. The larger particles cascade down the outside of the fireball in a downdraft even while the cloud rises, so fallout begins to arrive near ground zero within an hour. More than half the total bomb debris is deposited on the ground within about 24 hours as local fallout.

Smaller radioactive particles will enter the atmosphere and gradually settle to the earth's surface after weeks, months, and even years.

Radioactive fallout particles enter the water supply and are inhaled and ingested by people thousands of miles from the blast.

Between 1946 and 1996, more than 280 nuclear weapons were tested in the Pacific region alone. Each of these weapons had much higher yields than the bombs dropped on Hiroshima and Nagasaki. Testing of nuclear weapons has resulted in radiation exposure in countries around the world. Radiation is known to cause chromosomal damage and illnesses such as cancer.

HIROSHIMA AND NAGASAKI

What Were the Effects of the Atomic Bombs Used at Hiroshima and Nagasaki?

On August 6, 1945, a B-29 American bomber dropped a nuclear bomb called “Little Boy” over the center of Hiroshima, Japan. It exploded about 2,000 feet above the city with a blast equivalent to about 13 kilotons of TNT—only a fraction of the destructive power of nuclear bombs today.

An estimated 90,000 people died instantly. The radius of total destruction was about one mile, with resulting fires across more than four square miles. Ninety percent of Hiroshima's buildings were damaged or completely destroyed.

By December 1945, thousands had died from their injuries and radiation poisoning, bringing the total killed in Hiroshima in 1945 to perhaps 140,000.

Three days after the first bombing, on August 9, 1945, another B-29 dropped a second atomic bomb on Nagasaki, over the city's industrial valley, about two miles from the planned target.

The resulting explosion had a blast yield equivalent to 21 kilotons of TNT.

According to some estimates, about 70,000 of Nagasaki's 240,000 residents were killed instantly, and up to 60,000 were injured.