



Fact Sheet: What is a nuclear weapon?

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- A nuclear weapon is a weapon whose explosive power is generated by the process of nuclear fission (an **atomic bomb**) or nuclear fusion (a **hydrogen** or **thermonuclear bomb**).

How is a nuclear weapon different from a conventional weapon?

- In order to create a fission or fusion reaction, a nuclear weapon must use what are commonly called **fissile materials**, either plutonium or highly enriched uranium (HEU), to fuel its explosion.
- A conventional weapon does not use fissile materials as its explosive fuel. As a result, even a nuclear weapon with a relatively small yield is much more destructive than any conventional weapon, with the capability to nearly destroy an entire city.

What happens in a nuclear explosion?

- A nuclear explosion is the result of a rapid release of energy from a nuclear reaction, either fission or fusion. The result is an enormous blast of energy and thermal radiation.
- **Nuclear Fission:** In a nuclear fission reaction, the nucleus of an atom is split into two smaller nuclei and other by-product particles. If this process is uncontrolled, as in a nuclear weapon, it starts a chain reaction whereby large amounts of energy are rapidly released. Nuclear fission is the type of nuclear reaction that was used in the atomic bombs the United States dropped on Hiroshima and Nagasaki during WWII.
- **Nuclear Fusion:** Whereas an atom is split in the process of nuclear fission, in a nuclear fusion reaction many nuclei come together to form one heavier nucleus, causing the release of great amounts of energy in self-sustaining reactions. Thermonuclear weapons involve both fission and fusion.

What is a kiloton? A megaton?

- **Kilotons (kt):** a unit of measuring the explosive power of a nuclear explosion. This measurement is in relation to the explosive power of an equivalent amount of TNT. For example, a 15kt nuclear explosion (the size of the explosion in Hiroshima) has the explosive power equivalent to 15,000 tons of TNT.
- **Megatons (Mt):** Also in relation to the explosive power of an equivalent amount of TNT, a megaton is the explosive power equivalent to 1 million tons of TNT, or 1,000 kilotons. This level of power can only be obtained through a thermonuclear or hydrogen blast.
- If you wanted to picture the amount of TNT needed for a 1-Megaton explosion, imagine a 200-mile long train filled with TNT; for a 5-Mt bomb, a train 1000 miles long.¹

¹ Jonathan Granoff. *Nuclear Weapons, Ethics, Morals, and Law*. Brigham Young University Law Review. Vol. 2000, No. 4. Pages 1413-1442. Available at: <http://www.gsinstitute.org/gsi/docs/BYU.pdf>