**CND Peace Education work in schools and colleges throughout the country. Young people have lots of questions about nuclear weapons.**

**CND saw the need for a factsheet geared towards young people. One using clear and concise language.**

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## **Hiroshima & Nagasaki**

### What type of bombs fell on the cities?

A single atom bomb fell on each city. Each had about the same power. But they had very different designs.

The Hiroshima bomb used uranium. Two lumps of uranium joined to make a bigger lump. The extra weight made the bomb explode.

The Nagasaki bomb used plutonium. The bomb first compressed the plutonium. The extra density made the bomb explode.

### How far did the damage extend?

Nearly everything lay in ruins up to three miles[[1]](#endnote-1). Roughly the same area of ten thousand football pitches.

Roof tiles dislodged up to five miles. Glass broke up to twelve miles.

### How long did radiation on the ground last?

Black radioactive rain fell on large regions of both cities.

At Hiroshima, it took one year for the radiation on the ground to drop to a safe level.

At Nagasaki, it took nine years for radiation to drop[[2]](#endnote-2).

Nagasaki took longer because of the different bomb design[[3]](#endnote-3).

### How many people lived in the cities?

In Hiroshima 350,000 people. Nearly all civilians[[4]](#endnote-4).

In Nagasaki 240,000 people. Nearly all civilians[[5]](#endnote-5),[[6]](#endnote-6).

### How many people died?

In the first few months after the bombs, over 210,000 people died4,5.

How can we comprehend this number? Picture the victims lay down on the ground, shoulder to shoulder. That line would stretch out over fifty miles. To count each victim one by one would take three days non-stop[[7]](#endnote-7).

In later years, thousands continued to die from their injuries[[8]](#endnote-8).

### Any photos from within the cities?

At Hiroshima, seven photos survive from the day of the bomb[[9]](#endnote-9),[[10]](#endnote-10).

In Nagasaki, about a hundred photos survive from one day after the bomb[[11]](#endnote-11).

Many more photos exist from later times (eg. see [gensuikin.org](http://www.gensuikin.org/english/photo.html) and [nytimes.com](https://www.nytimes.com/2020/08/06/world/asia/hiroshima-nagasaki-japan-photos.html)).

## **Nuclear Weapons (nukes)**

### What’s an A-bomb?

An atom bomb (A-bomb) is a weapon that gets its immense power from nuclear fission.

In fission, the nucleus of an atom splits. With enough nuclei close together, one atom split causes other atoms to split - a ‘chain reaction’.

Fission only happens in heavy metals like uranium and plutonium. Plutonium is the substance of choice, as less is needed to make a bomb.

### What’s an H-bomb?

The hydrogen bomb (H-bomb) gets its power from nuclear fusion.

Fusion happens when two hydrogen nuclei combine to form helium. The sun works that way.

It has to be very hot for fusion to work. An A-bomb *within* the H-bomb produces that heat.

H-bombs are up to a thousand times the power of A-bombs.

### Does an H-bomb produce radiation?

The A-bomb part makes the radiation; the hydrogen part does not.

### Why does the chain reaction stop when a nuke explodes?

The chain reaction carries on as long as the warhead stays in one piece. Once the bomb explodes, it shatters into many pieces. So the chain reaction stops.

### What’s a warhead?

An A-bomb or an H-bomb

### What’s a missile?

A rocket attached to one or more warheads.

Sometimes ‘missile’ refers to the rocket and warhead combined.

### How long does the radiation last on the ground?

It depends on the power of the bomb and how far above the ground it explodes. Here are three cases.

* A few weeks before Hiroshima, the US tested a nuke close to the ground at a New Mexico desert. It sucked up a lot of sand, which melted and mixed with radiation. Radioactive liquid glass rained down on the local area. Radiation today is still 90 times above the safety limit[[12]](#endnote-12).
* Hiroshima took one year to reach a safe level, and Nagasaki nine years2.
* Over sixty years ago, the US tested over sixty nukes in the Marshall Islands. Four islands are still radioactive (Bikini, Runit, Enjebi and Naen). Bikini is a thousand times worse than Chernobyl or Fukushima[[13]](#endnote-13). (Naen island isn’t even nearby – it’s one hundred miles away).

### Is it easy to make a nuke?

It takes a vast amount of time and effort.

The first two A-bombs cost billions of dollars to make. They employed over 130,000 people and took more than three years to finish[[14]](#endnote-14).

### Do nukes produce nuclear waste?

To make and maintain nukes creates a certain amount of nuclear waste.

It’s like other nuclear wastes[[15]](#endnote-15), but there’s much less of it[[16]](#endnote-16).

### How do you get rid of a nuke?

The warhead is first taken off its missile and put into storage. Then it’s taken apart piece by piece, in the reverse order to its build[[17]](#endnote-17).

The US had a neat way to get rid of warheads. They burnt old Russian warheads in power stations to produce electricity. Enough to power one in ten light bulbs[[18]](#endnote-18). And dispose of twenty thousand warheads. Sadly, this no longer happens.

## **Today’s Threats**

### How many countries have nukes?

Nine countries own nukes (UK, France, US, China, Russia, North Korea, India, Pakistan and Israel).

Other countries might be trying to get them[[19]](#endnote-19).

### Could a random fire cause a nuke to explode?

British nukes are designed not to explode in a fire[[20]](#endnote-20).

But they are not fully immune. A fire can spread radiation over a wide area[[21]](#endnote-21). That’s why people worry about the routine transport of nukes on British roads[[22]](#endnote-22). Especially people living nearby.

### What’s the Doomsday Clock?

The [Doomsday Clock](https://thebulletin.org/doomsday-clock/) is a symbol. It warns about the threat of nuclear war and other man-made disasters. The closer to midnight, the closer to disaster.

Right now (2020) it’s a hundred seconds to midnight - the closest to midnight ever.

### Could a cyber-attack launch a nuke?

A cyber-attack might fool leaders to think an attack had started[[23]](#endnote-23). In reply, thousands of nukes might launch for real.

### Could terrorists get a nuke?

Some have already tried [[24]](#endnote-24).

One day they might succeed[[25]](#endnote-25).

### What happens if a nuke explodes in a city?

The online tool [Nukemap](https://nuclearsecrecy.com/nukemap/) draws a map of the damage from a nuke.

Type in an address, and Nukemap displays the blast, fire and radiation zones. It also gives the number of dead and injured.

### What happens if a nuke explodes near the sea?

[Nukemap](https://nuclearsecrecy.com/nukemap/) (see above) maps out the main damage[[26]](#endnote-26).

Also, the mushroom cloud sucks up vast amounts of seawater. The water picks up radiation, then floods the local area with black radioactive rain[[27]](#endnote-27).

### What’s fallout?

Radioactive dust or rain falling to the ground after a nuke explodes.

### How far can fallout travel?

Lethal fallout can cover an area up to 350 miles long and sixty miles wide[[28]](#endnote-28). That’s more than twice the size of Wales.

### How many nukes does it take to destroy the planet?

Even a small nuclear war will badly damage the planet. Cities and forests burn out of control. Vast amounts of smoke rise into the sky and surround the earth with a shroud of soot. Sunlight is blocked, temperatures plummet and crops fail. Two billion people might starve[[29]](#endnote-29).

A large nuclear war will cause a full-blown Ice Age. Most would not survive[[30]](#endnote-30).

### Could I survive if a nuke explodes near me?

In 1980, the UK produced the pamphlet *Protect and Survive*[[31]](#endnote-31). If the worst should happen, the pamphlet tells us to shelter in a nearby building and await help. The US has similar advice[[32]](#endnote-32).

But will buildings exist in which to take shelter? It’s doubtful – not up to twenty-five miles from the blast[[33]](#endnote-33).

And don’t count on any help. Radiation on the ground would prevent rescue workers from getting to you. The whole country would probably be in ruins.

If there’s enough distance between you and the blast you will survive. But life will be grim, like never before.

## **Treaty on the Prohibition of Nuclear Weapons (TNPW)**

### Is there a law that bans nukes?

The [Treaty on the Prohibition of Nuclear Weapons](https://www.icanw.org/the_treaty) (TNPW) is an international law that bans nukes. Sixty-three per cent of nations support the Treaty[[34]](#endnote-34).

It entered into force on 22nd January 2021 with 68 signatories and 66 states parties.

Even though it has become law, countries with nukes don’t have to give them up.

But as more and more countries ratify, it’s hoped that nuclear countries will come to their senses.

### Why should a country sign?

Reasons include:

* It makes the world a safer and better place. The United Nations has wanted to ban nukes right from its birth[[35]](#endnote-35).
* Money. The US alone would save over a trillion dollars if it scrapped its nukes[[36]](#endnote-36).
* Using them is already a war crime in most cases[[37]](#endnote-37).

### Is a ban likely?

The world has banned biological and chemical weapons, so why not nukes?

Some say a ban cannot work as ‘the genie’s out of the bottle’. The knowledge is out there and cannot be erased.

But knowledge is not enough. It takes a huge amount of time, effort and equipment to make a nuke from scratch. Time enough to prevent their build.

### How long would it take to destroy all nukes?

With enough political will, a country could de-nuclearize within four years. For example, take Kazakhstan. Four decades of nuclear testing on its soil resulted in many deaths, cancers and birth defects. This fostered a deep enmity towards nukes[[38]](#endnote-38). So once free from Soviet control in 1991, Kazakhstan immediately embarked on a program to abolish its nukes.

The last nuclear warhead was removed on 24th April 1995[[39]](#endnote-39), and the last test nuke was destroyed on 30th May 1995[[40]](#endnote-40).

To destroy every nuke in the world would take a little longer.

Firstly, the nine nuclear nations would need to agree to disarm. This could take less than a year if they simply signed and ratified the Ban Treaty[[41]](#endnote-41). But it might take as least as long as the Chemical Weapons Convention, which was 10 years[[42]](#endnote-42).

Secondly, there is the physical process of dismantling and destroying all the warheads. This could take up to fifteen years.

So given the political will, it might take somewhere in the region of 15 to 25 years to destroy every single warhead.

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