SASTA OLIPHANT SCIENCE AWARDS

SOUTH AUSTRALIAN SCIENCE TEACHERS ASSOCIATION

Prize Winner

Science Writing

Year 3-4

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Topic- If It Happened Here: The Impact of a Nuclear Bomb on Adelaide
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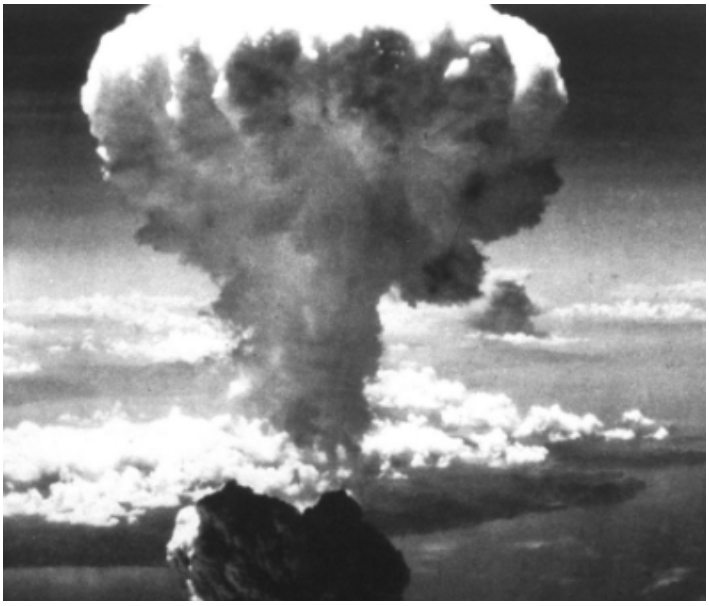
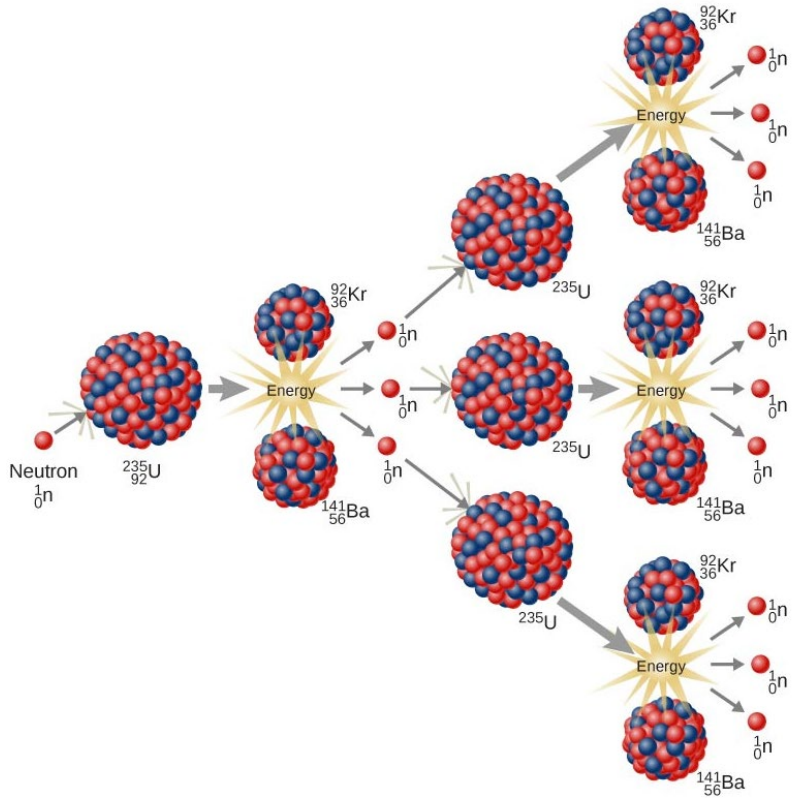
During the last school holidays, I had the opportunity to visit Japan with my family. During our family conversations, I learned that during World War 2 in August 1945, America bombed two cities of Japan- Hiroshima and Nagasaki. Japan is a beautiful country, and the people of Japan seem to be very peaceful. My heart sank to know that during the bombing, thousands of people lost their lives, thousands of them lost their limbs, and the effects of the bombs were felt for years after in the form of various cancers. Many questions started to come to my mind, like- What is a nuclear bomb? Why did America have to do that? And what could have happened if it had happened in Adelaide?



Picture 1- Mushroom cloud over Nagasaki 3 days after the bombing
https://edition.cnn.com/2020/08/04/world/gallery/hiroshima-nagasaki-atomic-bomb



Picture 2- Nuclear fission chain reaction
https://pressbooks.online.ucf.edu/osuniversityphysics3/chapter/fission/

What Is a Nuclear Bomb?

My mum is a science teacher, so I asked her, "What is a nuclear bomb?" She explained that it's an incredibly powerful weapon that gets its destructive force from a process called a nuclear fission chain reaction. Curious to understand more, we began researching the topic together.

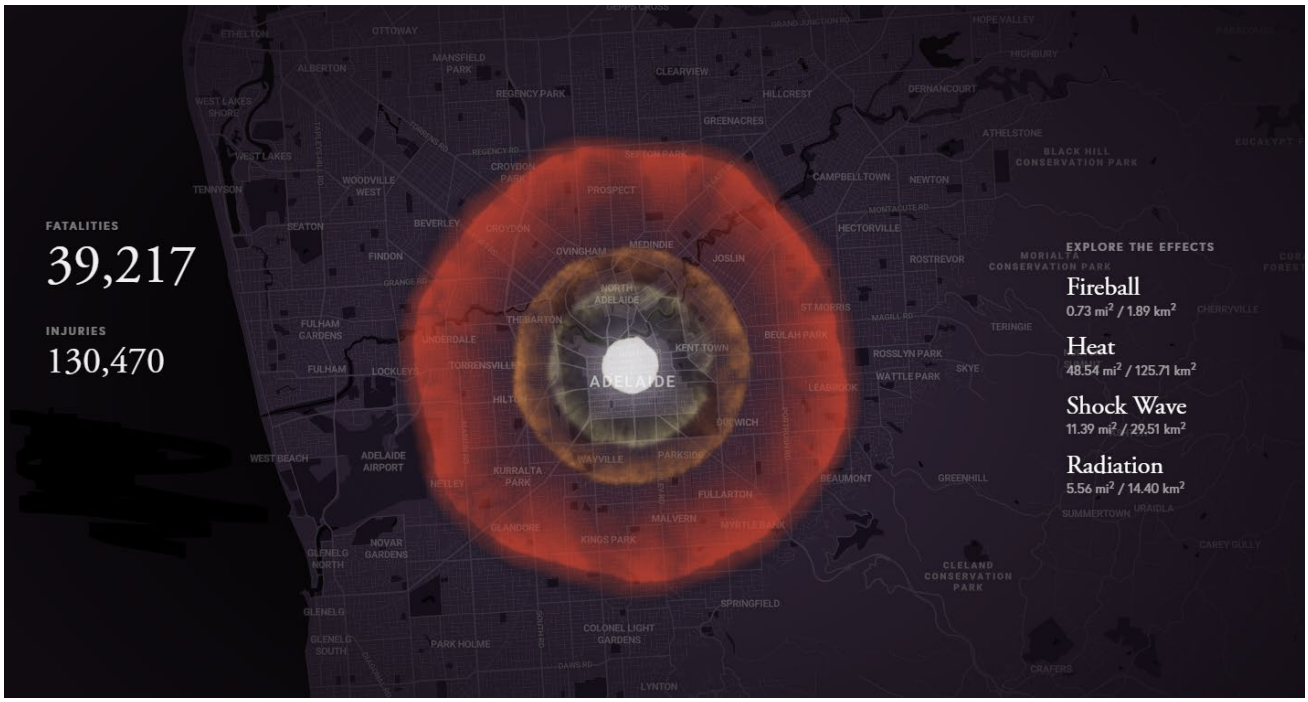
Nuclear fission is when a heavy atom splits into smaller parts, releasing lots of energy and tiny particles called neutrons. For example, when uranium-235 splits, it breaks into smaller atoms and sends out neutrons that hit other uranium atoms, causing a chain reaction. This happens really fast and creates a huge explosion with intense heat, bright light, and dangerous radiation.

Why did the U.S drop the nuclear bombs on Japan?

After learning about the nuclear bomb, I couldn't stop thinking about it. I went to my dad and asked, "Why did the U.S. drop the nuclear bombs on Japan?" He explained that it was connected to Japan's surprise attack on Pearl Harbor in 1941, which led the United States to enter World War II. Wanting to understand more, we began researching together. We discovered that by 1945, the war in the Pacific had become extremely brutal. Battles such as Iwo Jima and Okinawa had resulted in massive casualties on both sides, and many military leaders feared that a full-scale invasion of Japan would be even more devastating.
That same year, after President Franklin D. Roosevelt died, Harry Truman became the new president. Not long after taking office, he was told about a top-secret project called the Manhattan Project—America had been working on a powerful new weapon: the atomic bomb. After successfully testing it, Truman and his advisors sent a message to Japan, known as the Potsdam Declaration, demanding that they surrender completely or face serious consequences. When Japan refused to surrender, the U.S. made the difficult and historic decision to drop atomic bombs on the cities of Hiroshima and Nagasaki. Soon after, Japan surrendered, and World War II finally came to an end.

What If It Happened Here in Adelaide?

The thought of a nuclear bomb hitting Adelaide made me feel scared and sad. But I wanted to understand more, so I could think about what I might do to help reduce the risk. I explored and found that:
There are nuclear bombs as powerful as 50,000 kilotons, like the 'Tsar Bomba'. But even a smaller one like the 15-kiloton bomb dropped on Hiroshima would be devastating if it hit Adelaide. In just a millionth of a second, everything within 1 kilometre would be instantly vaporized by a fireball hotter than the surface of the sun. Within 8 to 9 kilometres, people would suffer severe burns, and fires would break out as wood, clothes, and plastic caught fire.



Picture 3- Experience the power of a low-yield nuclear weapon in your area
https://outrider.org/nuclear-weapons/interactive/bomb-blast?

The blast would create a powerful shockwave strong enough to flatten buildings within 4 kilometres. Most people in that area wouldn't survive because of collapsing structures or flying debris. Even worse

is the radiation—gamma rays and neutrons that damage the body's cells, causing radiation sickness. After the explosion, radioactive dust and ash—called fallout—would rise and spread with the wind. Depending on the weather, even places like the Adelaide Hills or Fleurieu Peninsula could be affected. People caught outside without shelter could get very sick, lose their hair, or even develop cancer later in life. That's why, in a nuclear emergency, staying indoors or in fallout shelters is so important.

Why Understanding Nuclear Bombs Matters

Learning about nuclear bombs was scary, but it helped me understand science, history, and why peace matters. The more we learn, the more we can do to prevent war and build a safer world. Many countries, including Australia, have agreed never to use nuclear weapons, and global leaders and scientists keep working to make sure they're never used. Thankfully, the chances of a nuclear bomb being used today are very low.

What Can Kids Do?

You don't have to be a scientist or president to make a difference.

- Learn about science and history to understand the world.
- Be kind and stand up for peace—it starts with how we treat others.
- Look after the planet, because a healthy Earth means fewer reasons to fight.

Final Thoughts

A nuclear bomb is one of the most powerful and scary things humans have created. But by learning about it, we can help make sure it never happens. Adelaide is a peaceful, beautiful city, and with smart science, strong communities, and a wish for peace, we can keep it that way.

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