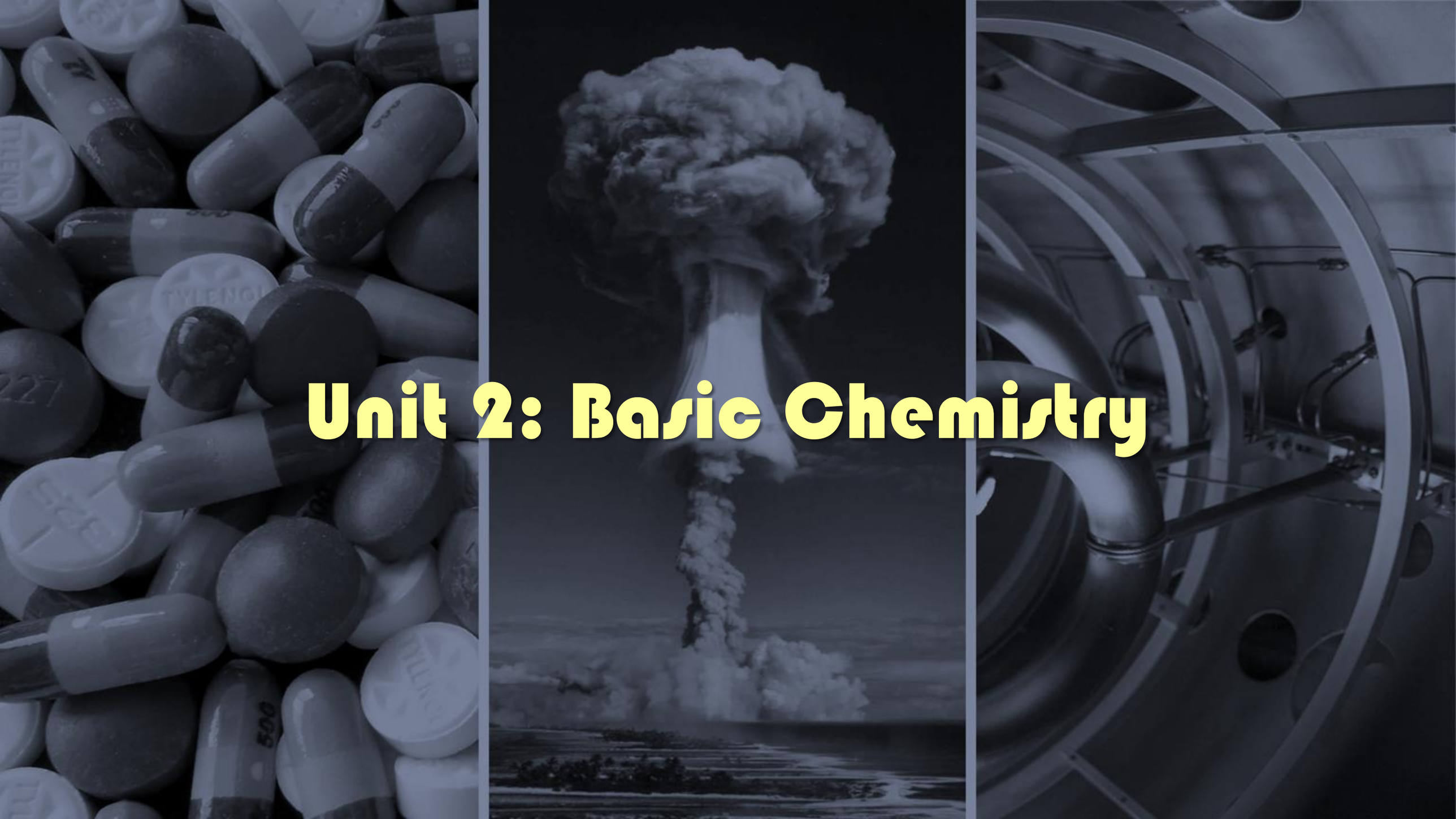
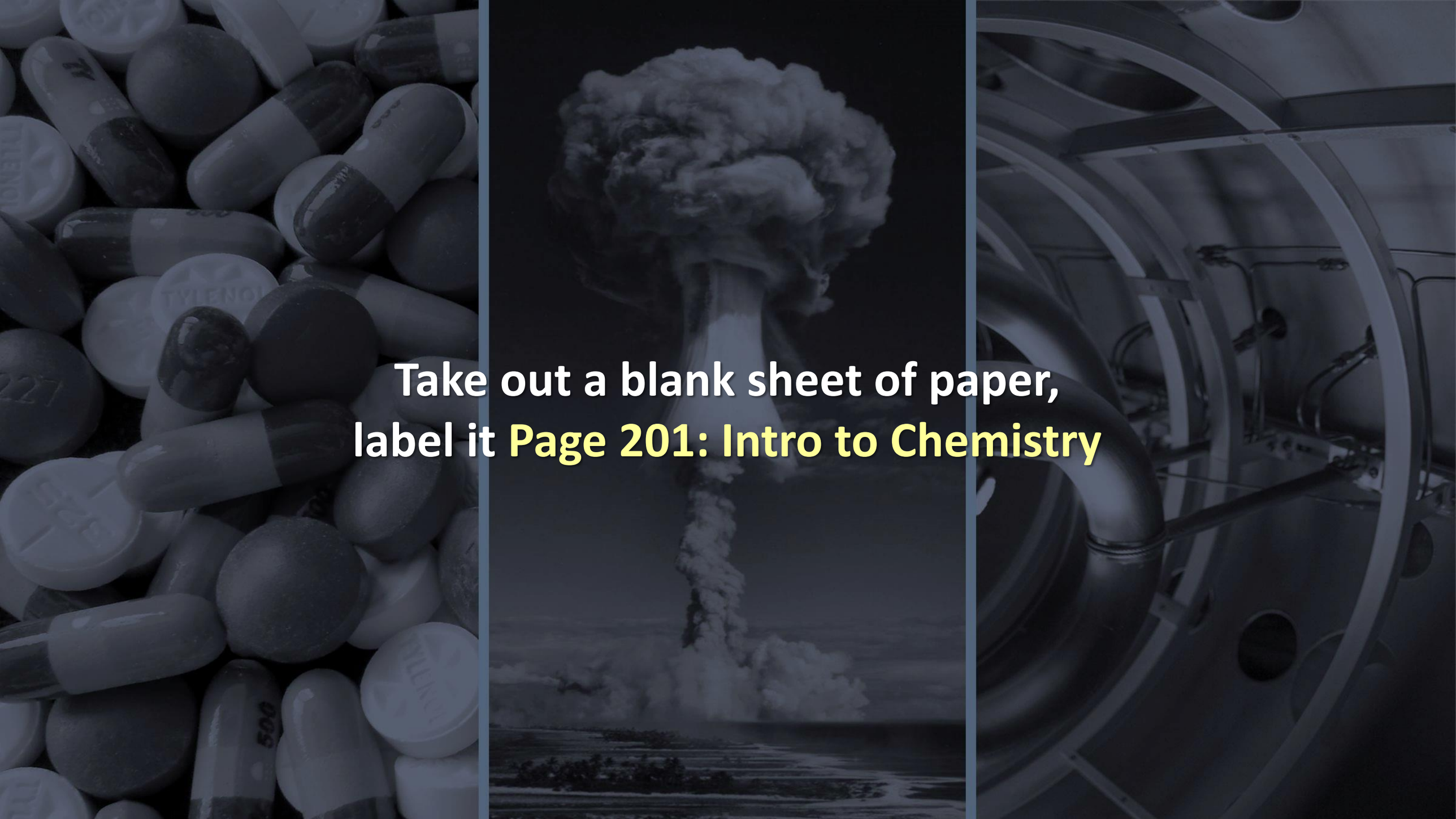
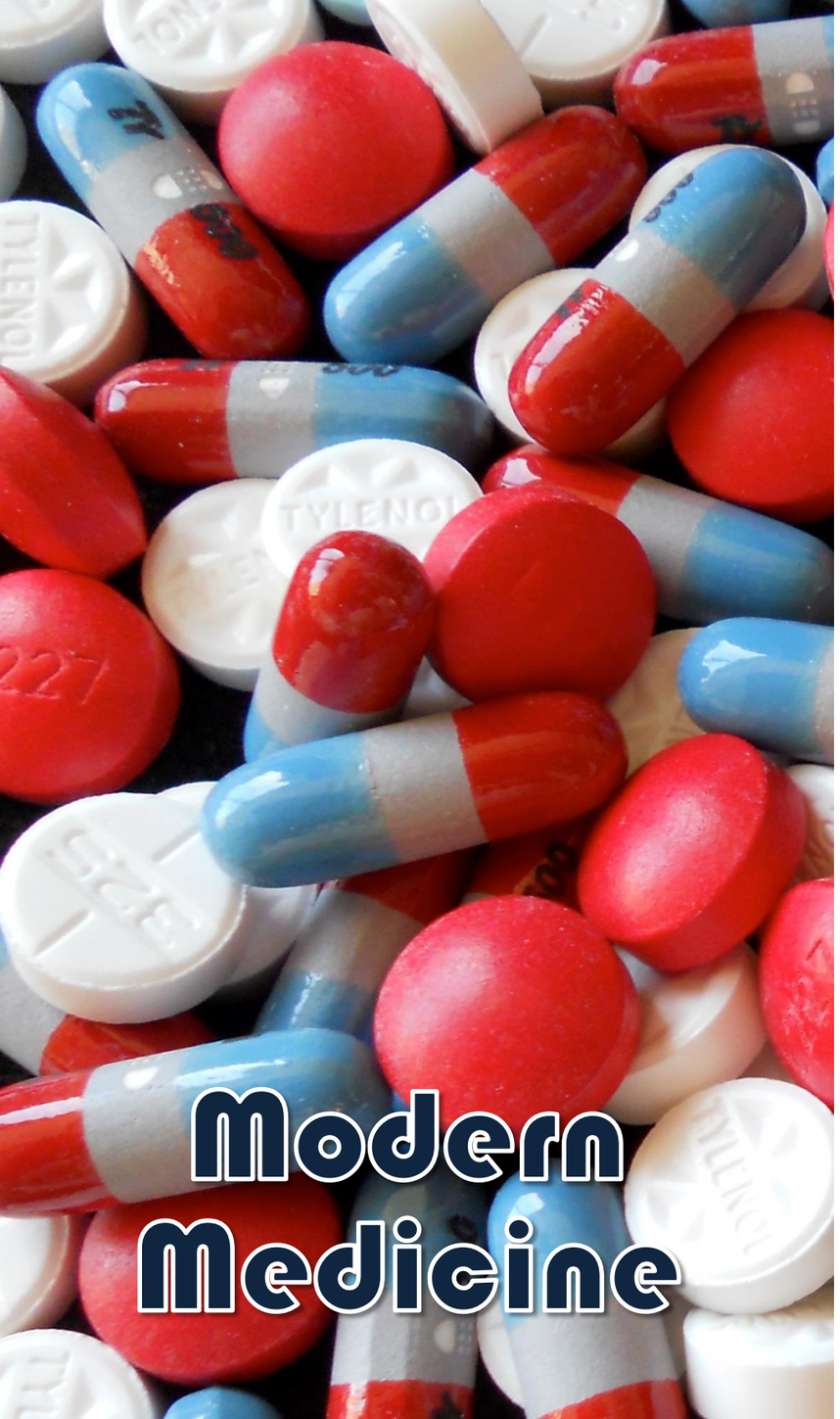


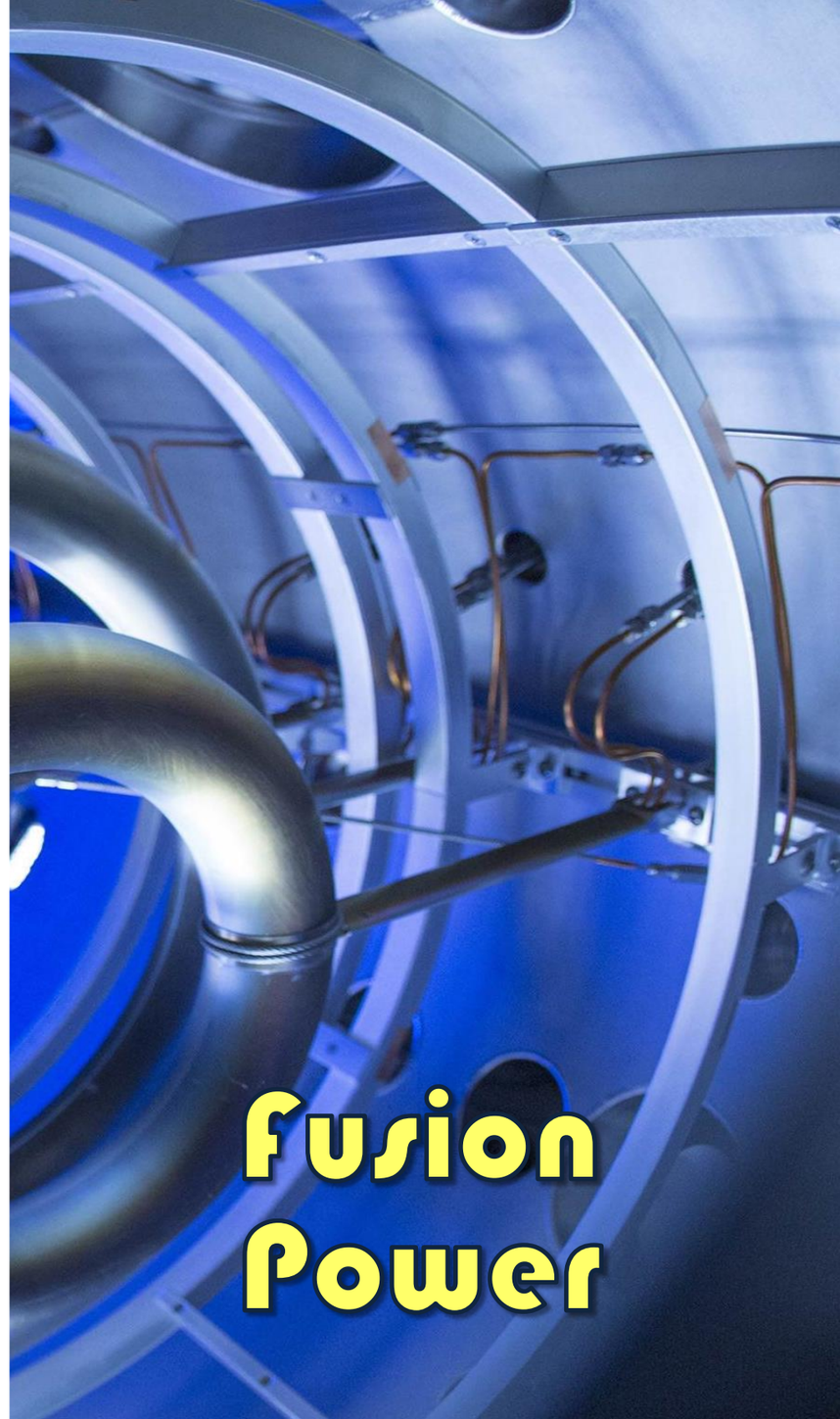
Unit 2: Basic Chemistry



Take out a blank sheet of paper,
label it Page 201: Intro to Chemistry

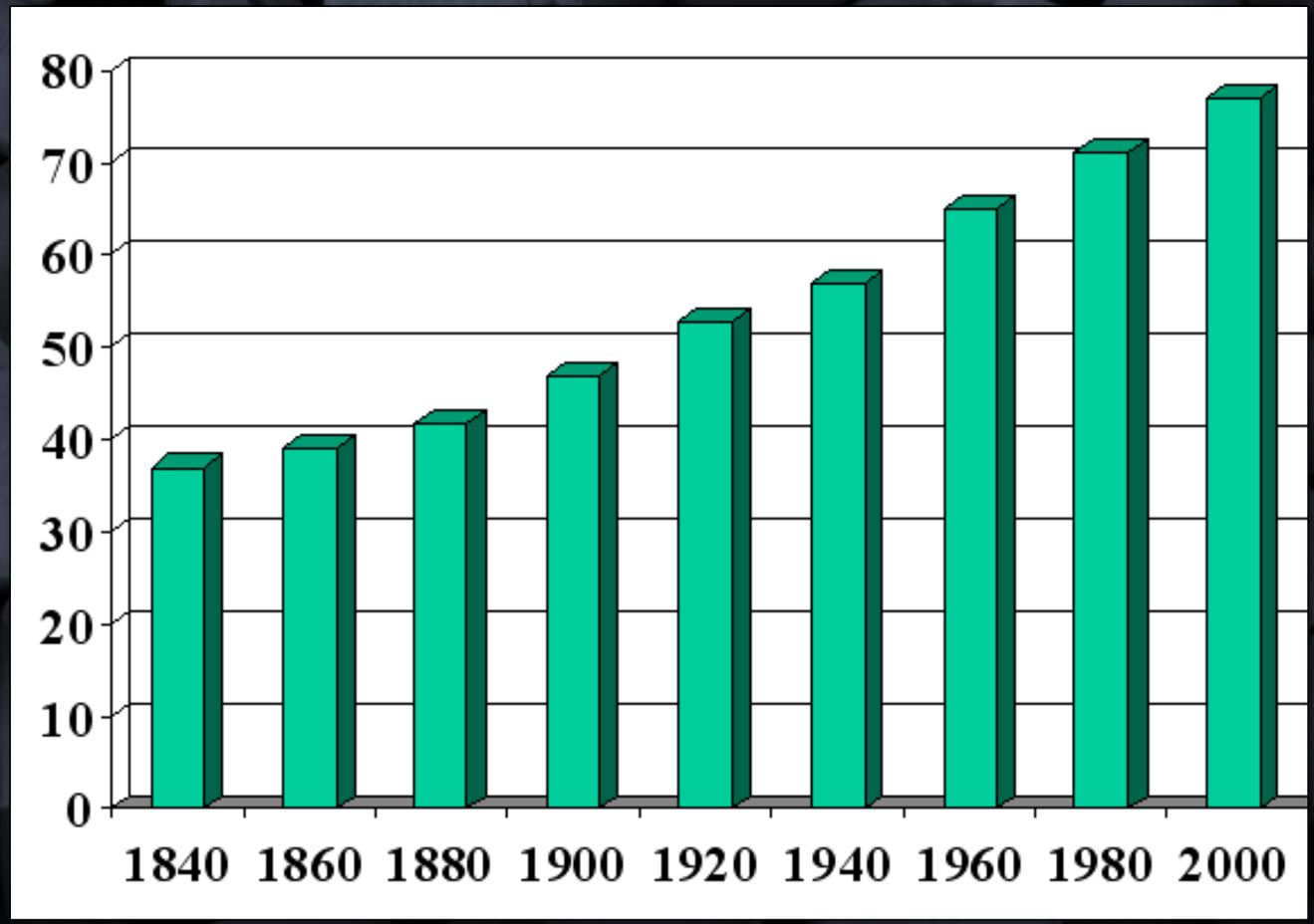

Modern
Medicine


Atomic
Bomb


Fusion
Power

Modern Medicine

- In medieval times, the human life expectancy at birth was 30 years. Among those who made it to adulthood, the life expectancy was 43.
- 1846 – William Morton develops first anesthetic (ether) for surgery.
- 1854 – John Snow uses chlorine for the first time to purify water.
- 1923 – Insulin first isolated to be used as a cure for diabetes.
- 1928 – Alex Fleming discovers penicillin, the first antibiotic.



Modern M

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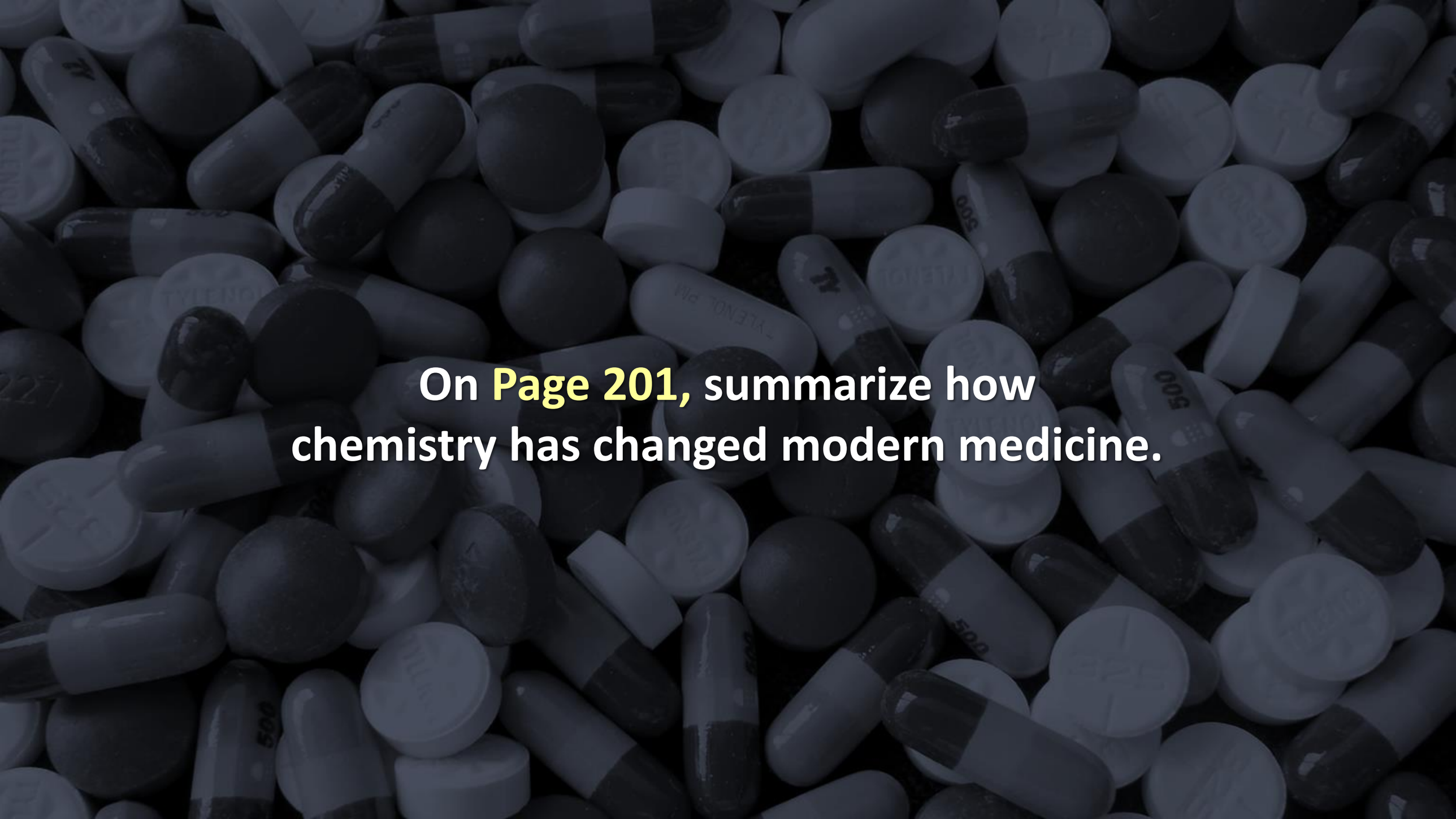


On Page 201, summarize how chemistry has changed modern medicine.

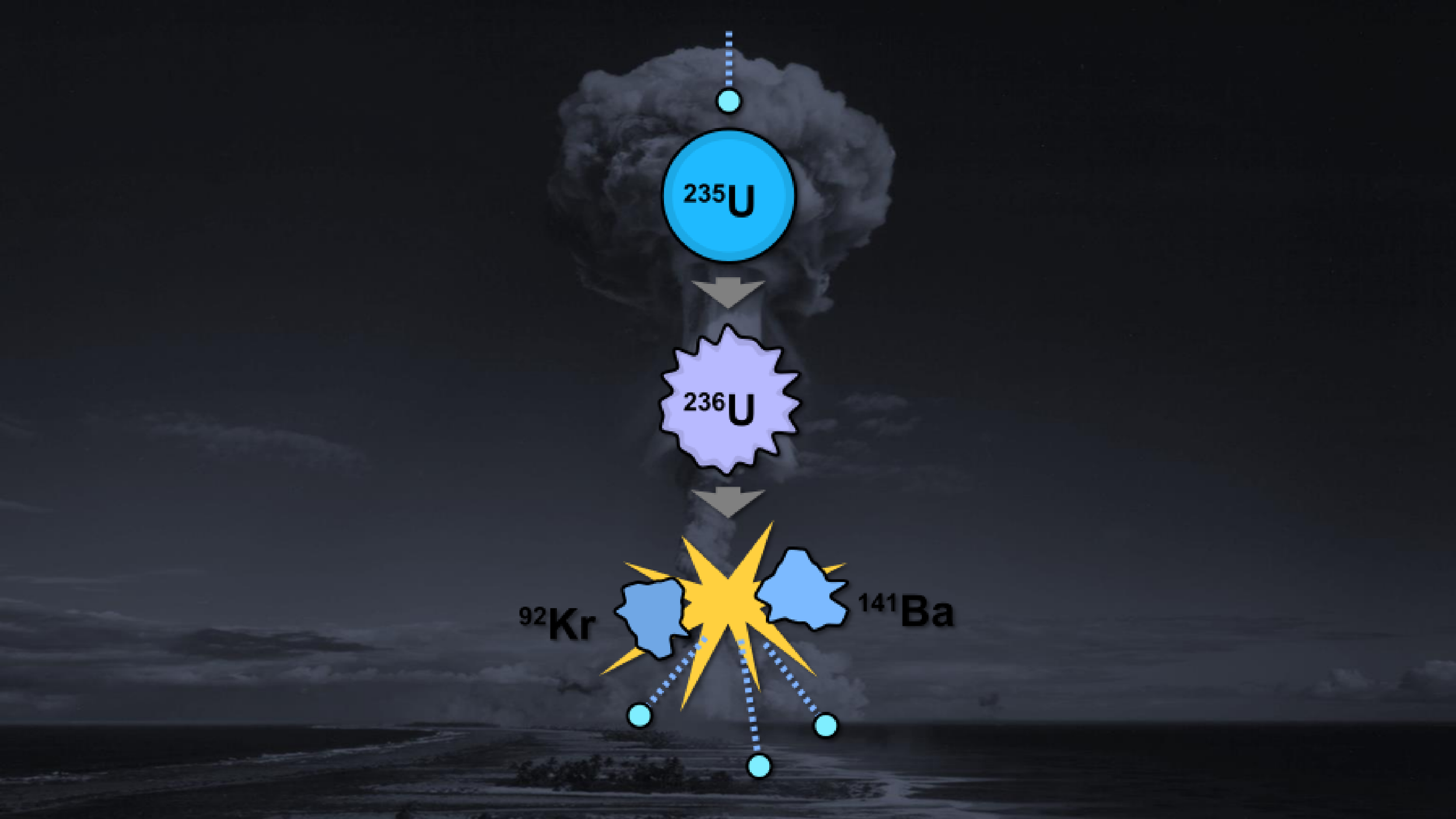

Atomic
Bomb

The History of the Atomic Bomb

- In 1911, scientists began experimenting with the atom (exposing them to radiation, shooting protons and neutrons at them, etc.)

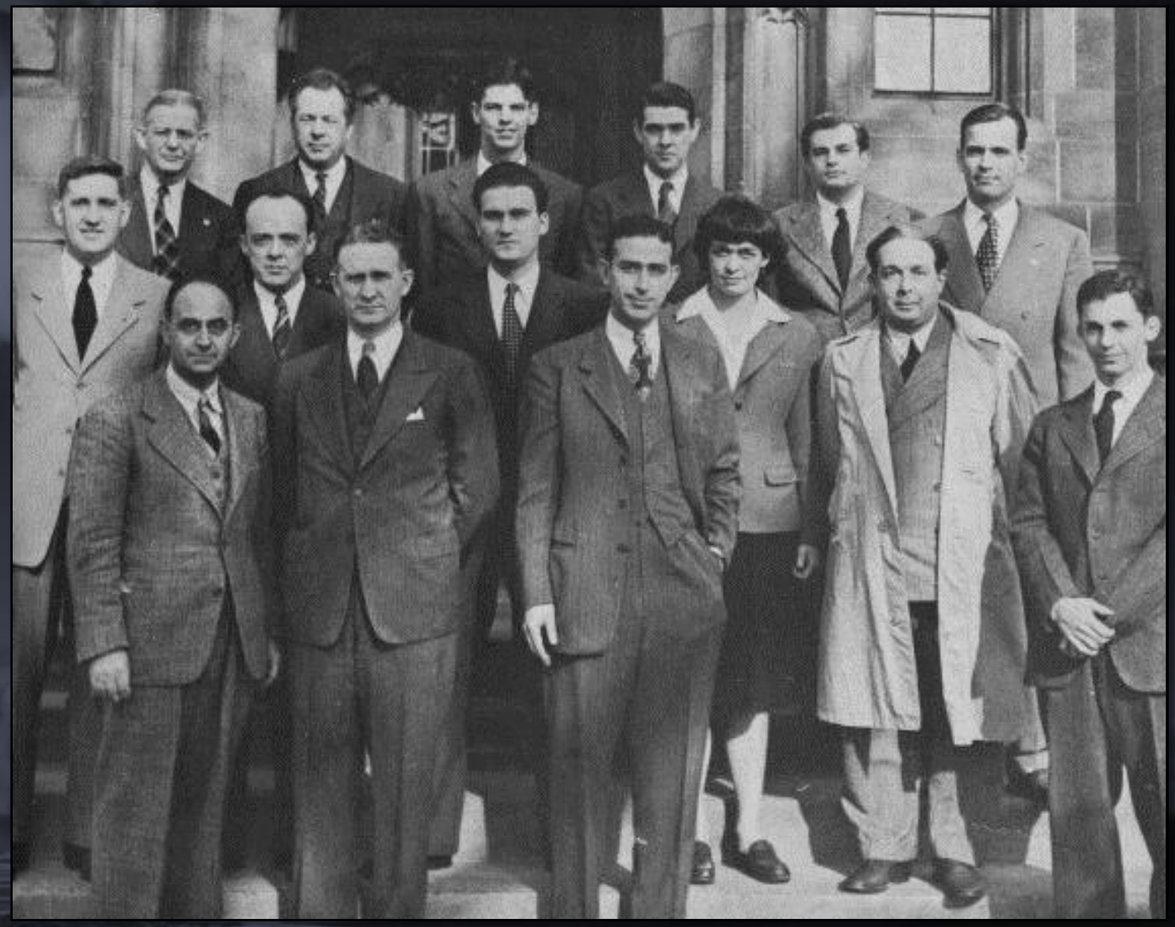
- By 1938, Hann and Strassman, two German scientists, discovered that by shooting neutrons at large atoms like Uranium, you could force t to break into pieces and release energy.

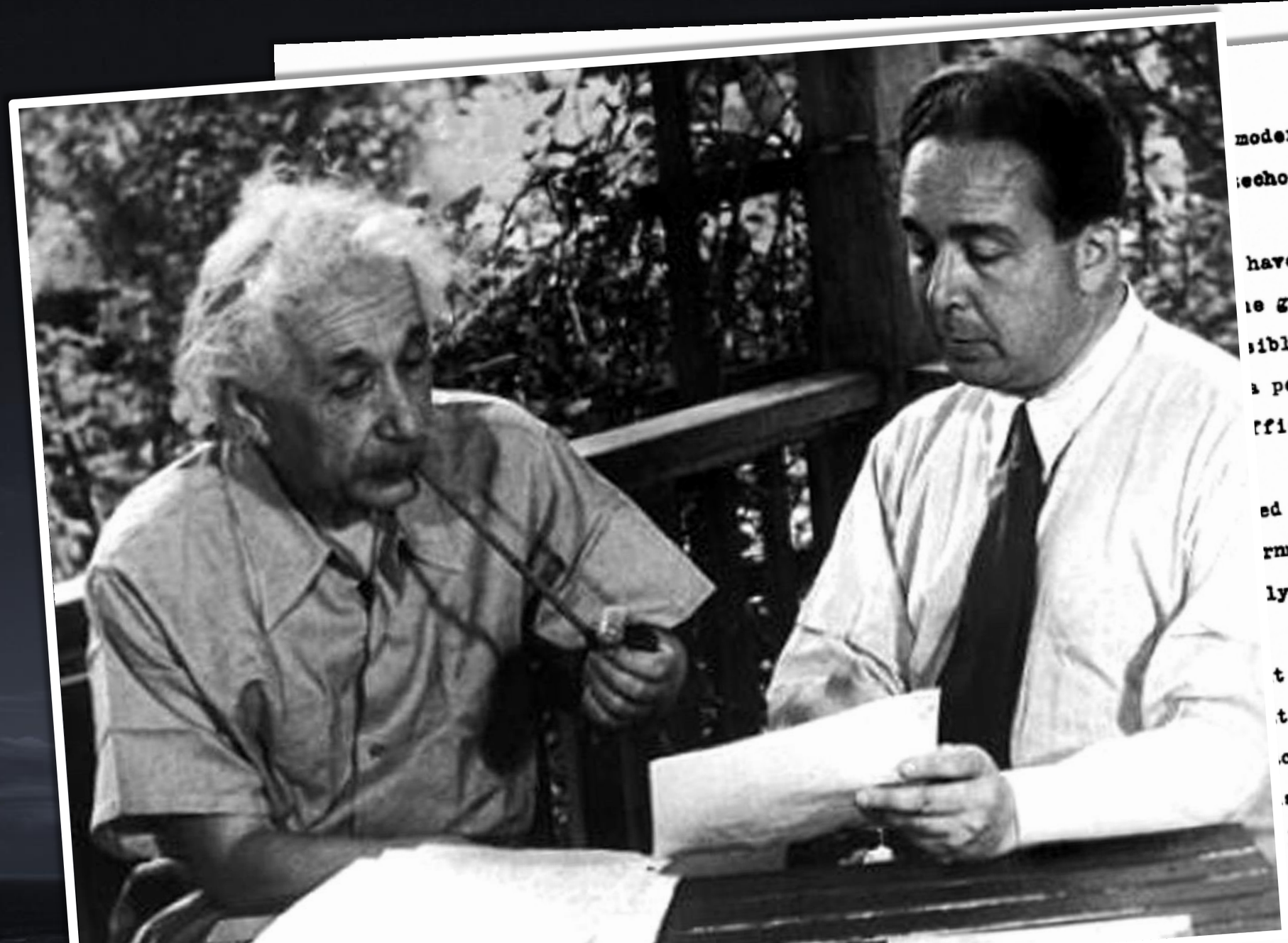
- Their discovery was published in 1938, just prior to the start of World War II.


^{235}U
^{236}U
^{92}Kr
^{141}Ba

The History of the Atomic Bomb

- In 1939, American scientist Leo Szilárd thought of using nuclear fission as a weapon. A chain reaction of splitting atoms, he thought, could produce an unimaginable release of energy.
- With the Nazi Party gaining strength, on the brink of World War II, Szilárd urged his two friends (Enrico Fermi and Frédéric Joliot-Curie) not to publish their research into nuclear chain reactions.
- Enrico Fermi heeded his request, Frédéric Joliot-Curie did not.





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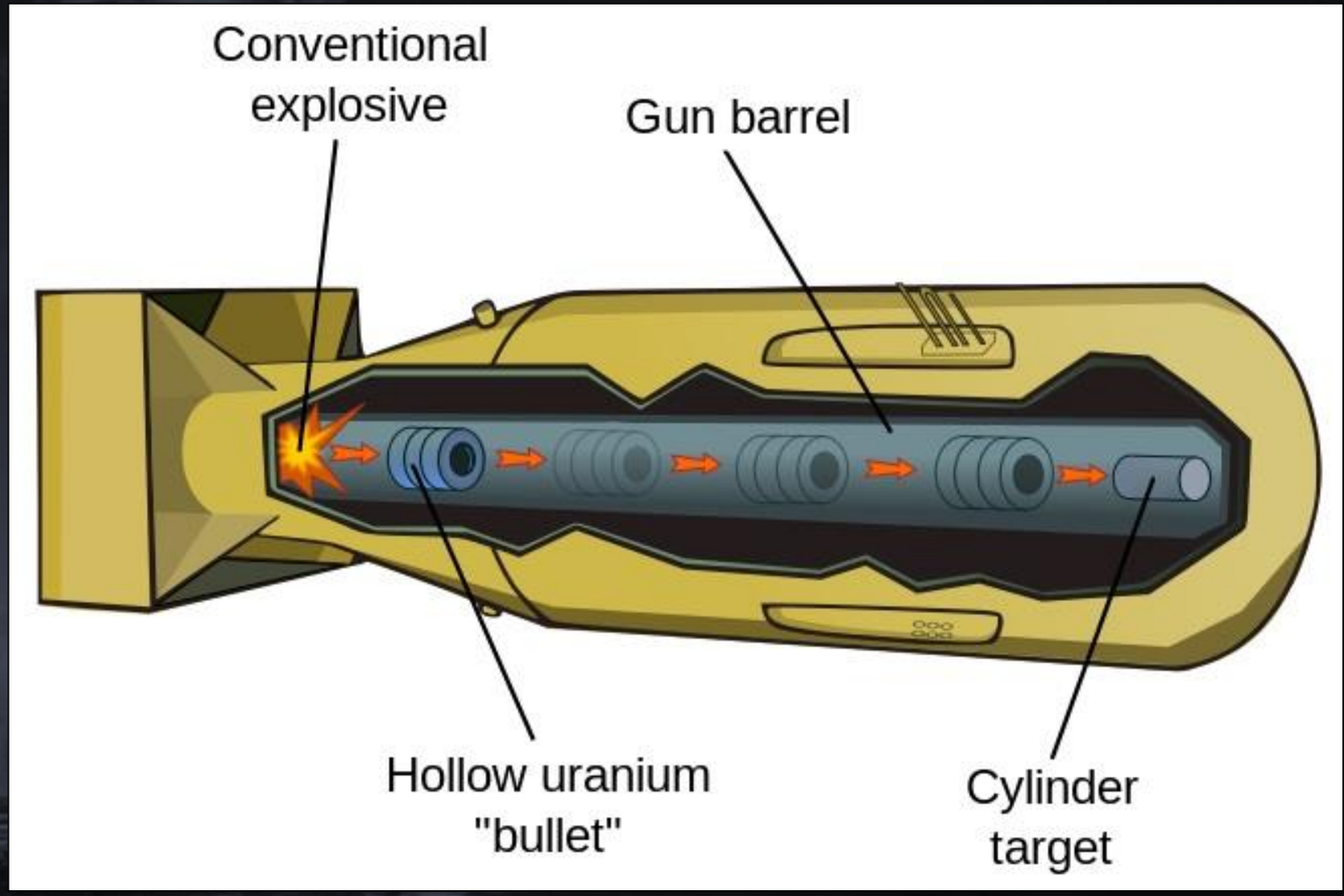
The Manhattan Project

- Roosevelt put together a team of the USA's best scientists. Their goal? Build an atomic bomb before the Germans do.
- Problem #1: How do we get Uranium 235?
- Problem #2: How do we make sure it doesn't blow up before we drop the atomic bomb?

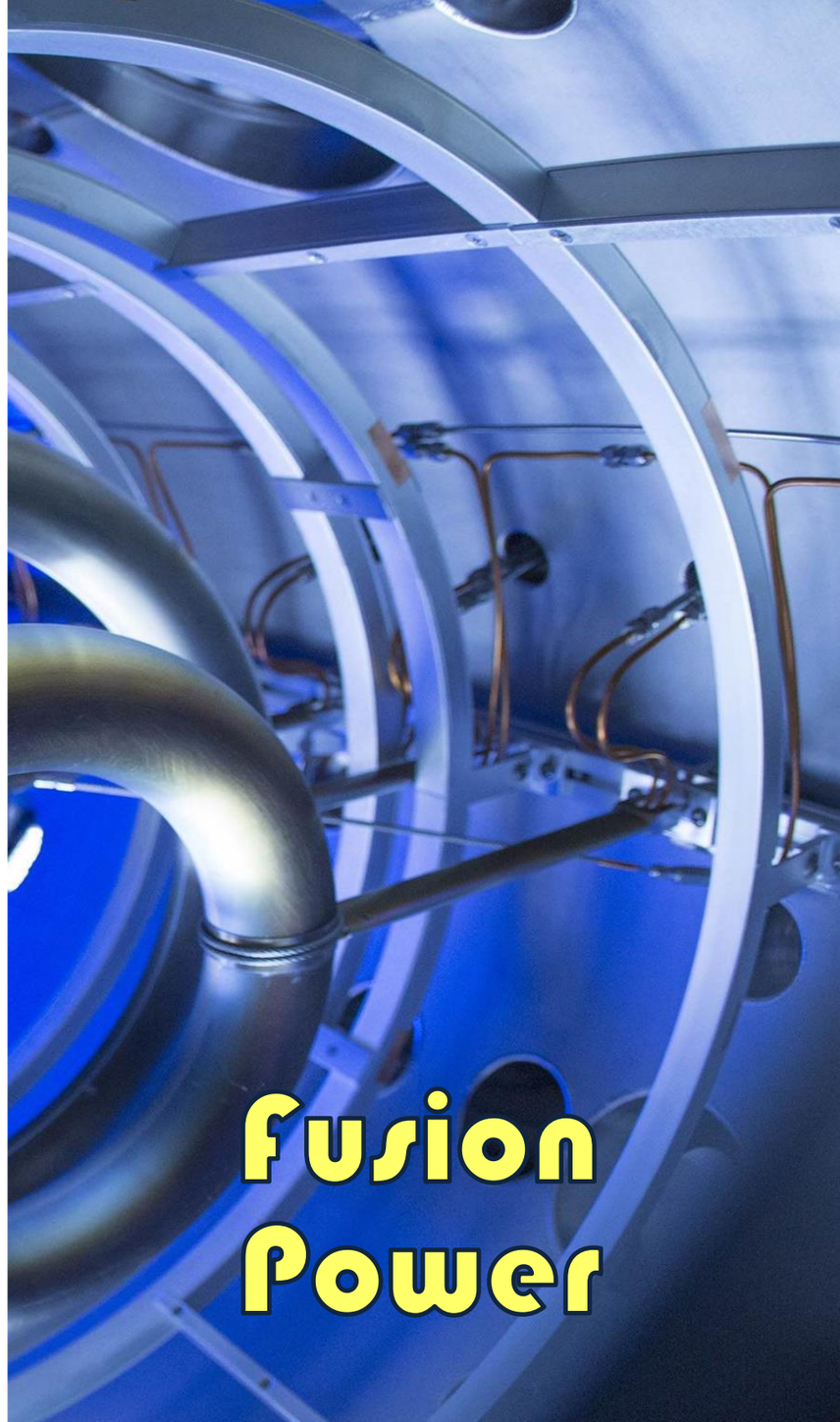
Bombing Japan

- Scientists chose the “gun type” method of detonation, in which two pieces of purified Uranium were mashed together using a gunpowder charge.
- Only two bombs were built by the USA, using slightly different designs.
- Bombs were dropped on Japan in August, 1945. The Japanese surrendered eight days later.



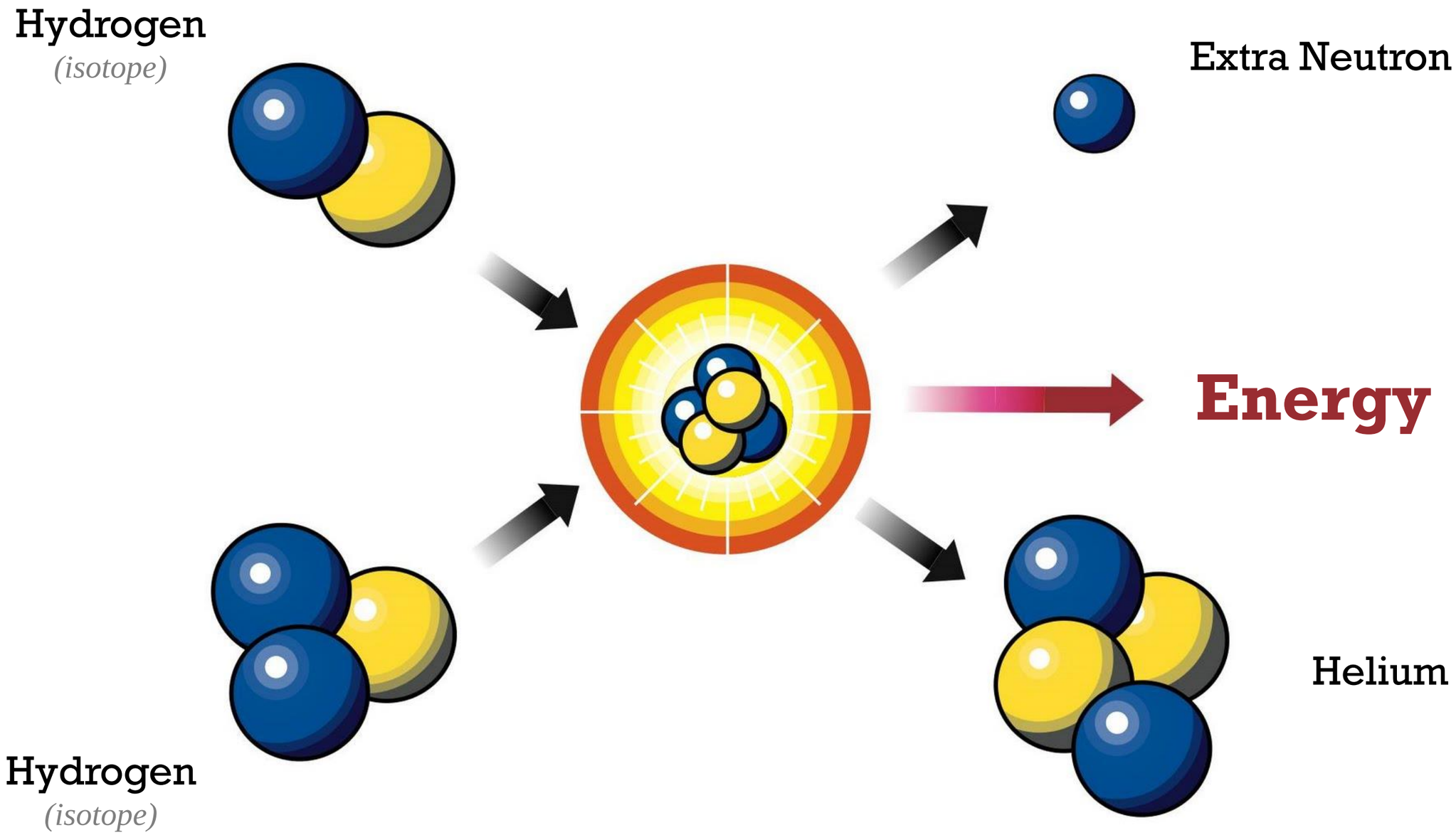
Aftermath


On Page 201, summarize
the story of the atomic bomb.


Fusion
Power

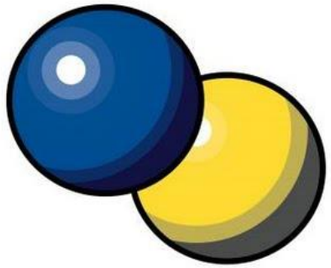

Fusion
Power

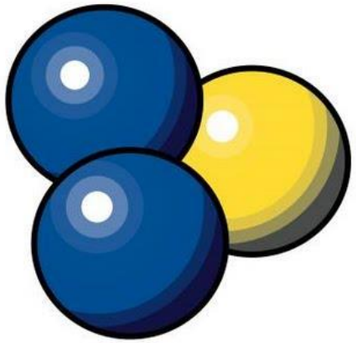
Fusion Power



Fusion Power

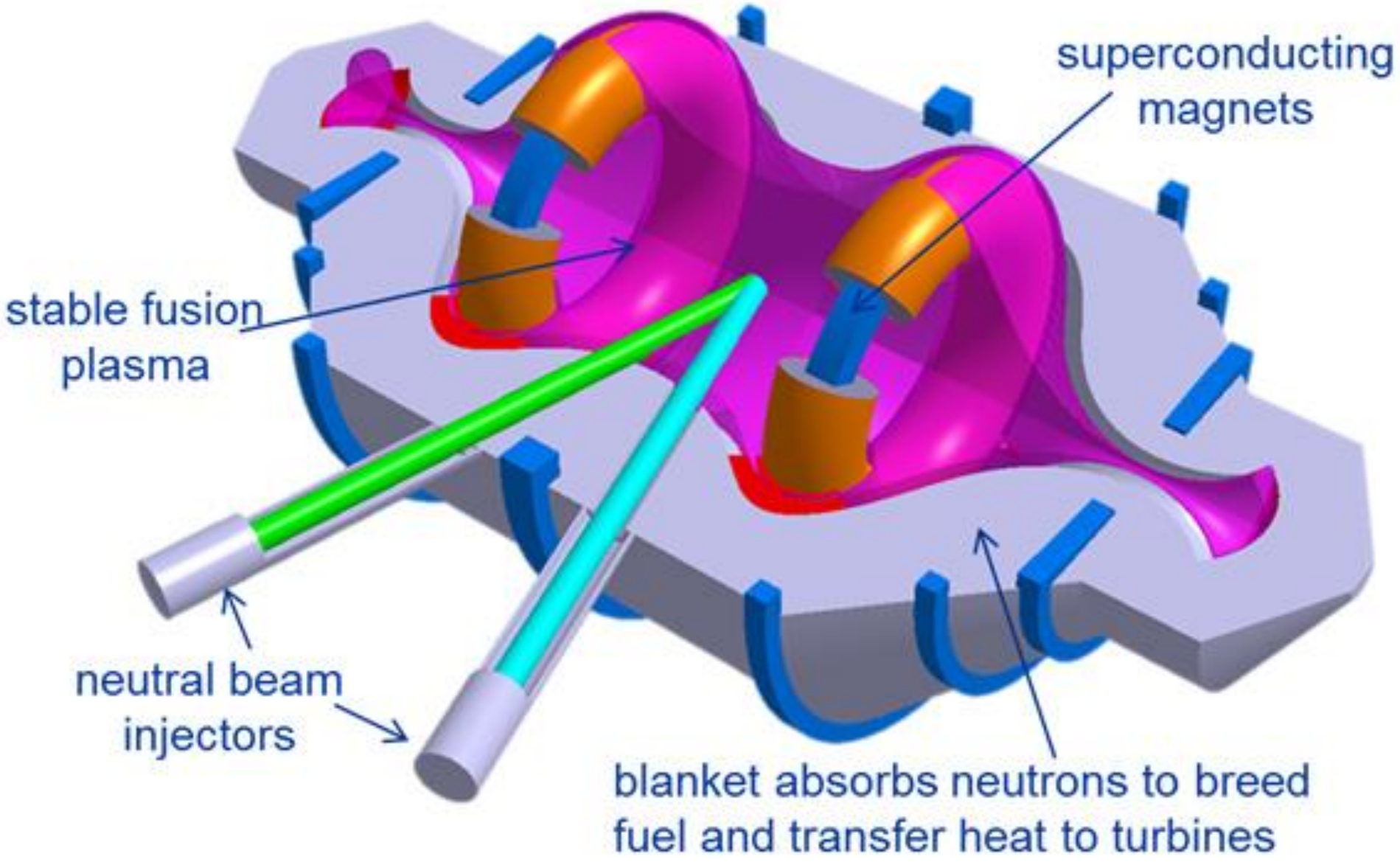
Hydrogen
(isotope)



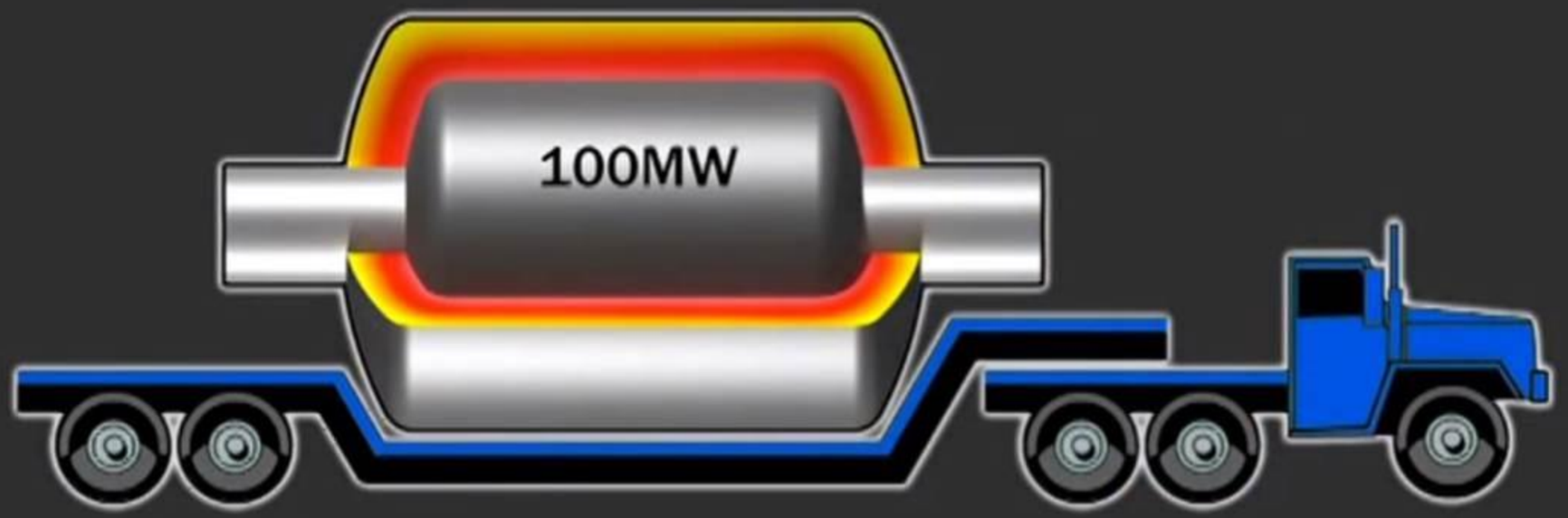


Hydrogen
(isotope)

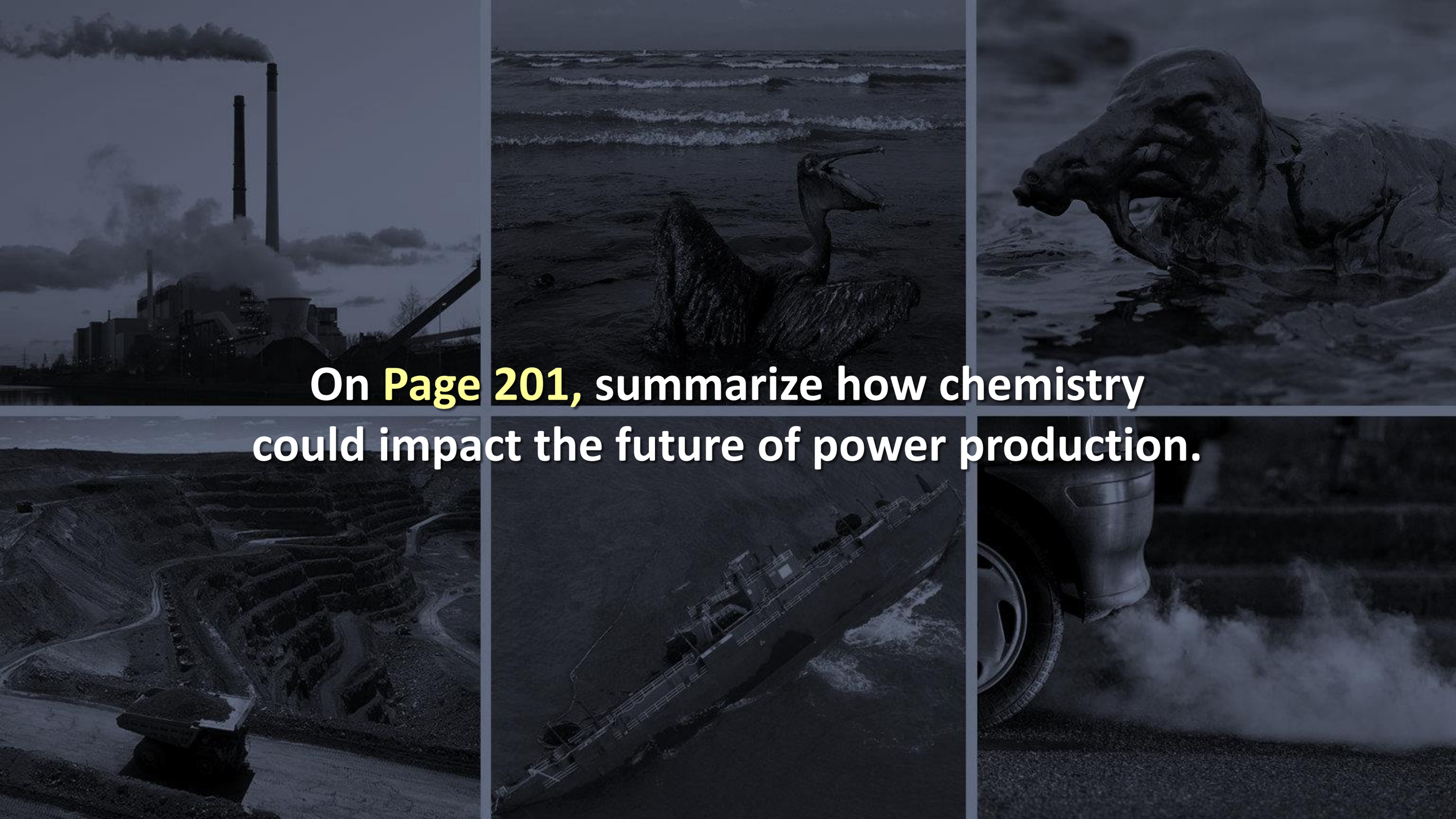
Fusion Power



Compact Fusion



Imagine all of Marshfield, Duxbury, and Hingham being powered by one large truck.



On Page 201, summarize how chemistry could impact the future of power production.