**Script**

**Introduction**

Good morning!! Today we are going to talk about the development of explosive.

Now, I will briefly introduce about what is chemical explosive,

A chemical explosive is a compound or a mixture which decomposes extremely quickly and produces much gas and heat. The rapid production of a large amount of heat causes a sudden expansion of the gaseous products. Such a chemical change is called explosion.

**Early-explosive Gunpowder**

I’m going to talk about the gunpowder. Gunpowder, also known as black powder, is a low explosive mixture of saltpeter (potassium nitrate), sulfur, and charcoal. Its development is believed to have started in China during the Tang Dynasty (618-907 AD) and was later introduced to Europe in the 13th century.

Initially, gunpowder was primarily used for fireworks, firecrackers, and in medicine. However, it soon became a weapon of war, and its use in cannons and firearms revolutionized the way wars were fought. The invention of gunpowder and its use in warfare had a significant impact on world history, allowing armies to conquer previously impregnable fortifications and to establish colonial empires.

Despite its importance, gunpowder was relatively unstable and dangerous to handle, which led to the development of more stable and powerful explosives, such as nitroglycerin and TNT. Nonetheless, the invention and use of gunpowder marked a significant milestone in the history of explosives and warfare, and its impact can still be felt today.

**Nitroglycerin**

I will be discussing the nitroglycerin part. Nitroglycerin is a high explosive compound that was first discovered by an Italian chemist, Ascanio Sobrero, in 1847. Sobrero discovered that a mixture of nitric acid and glycerin produced a highly explosive substance that was extremely unstable and dangerous to handle.

Despite its instability, nitroglycerin was used as an explosive, particularly in the construction and mining industries, due to its high power. However, the handling of nitroglycerin was extremely dangerous, and accidents were common.

In the 1860s, a Swedish chemist and engineer named Alfred Nobel found a way to stabilize nitroglycerin by mixing it with diatomaceous earth, a type of porous rock, to create a safer and more manageable explosive. This new explosive was called dynamite, and it quickly became widely used in construction, mining, and warfare.

Nobel's invention of dynamite revolutionized the explosives industry, allowing for safer and more efficient blasting of rock and earth, and enabling the construction of large-scale engineering projects, such as tunnels and canals.

However, dynamite was later replaced by more powerful explosives, such as TNT, which was discovered a few years after the invention of dynamite.

**TNT and other explosives**

I will be discussing the TNT explosives, the full name of TNT is called trinitrotoluene. TNT is a high explosive compound that was first synthesized by a German chemist, Julius Wilbrand, in 1863. It is more stable than nitroglycerin and less sensitive to shock and heat, making it easier and safer to handle. TNT was first used on a large scale during World War I and later in World War II, where it was used extensively in bombs and shells. Its explosive power and stability also made it a popular choice in construction, mining, and demolition work.

There are some other types of explosive which is C-4, a plastic explosive that was developed by the U.S. military during the 1950s as a more reliable and versatile explosive. C-4 is made up of a mixture of explosives, plastic binder, plasticizer, and a small amount of oil, which makes it malleable and easy to shape. Its use in military operations has also led to its use by terrorists and insurgents in improvised explosive devices (IEDs).

Plastic explosives, on the other hand, were first developed by the British during World War II as a more malleable and easier-to-use form of explosive. They are made by combining an explosive material with a plastic binder, which gives the explosive a putty-like consistency. This makes it easy to mold and shape the explosive to fit a particular situation.

**Nuclear explosive**

Moving on to another type of explosive, we have nuclear explosives. Also known as atomic bombs or nuclear weapons, these devices utilize the energy released during a nuclear reaction to produce a highly destructive explosion. The first nuclear weapon was developed by the United States during World War II as part of the Manhattan Project, which aimed to produce a weapon that could bring a swift end to the war.

The destructive potential of nuclear explosives is immense, with the ability to cause massive destruction and loss of life. As such, efforts have been made to limit the spread of nuclear weapons and to promote disarmament and non-proliferation treaties to prevent their use in warfare. The use of nuclear weapons has only occurred twice in history, both times by the United States against Japan in 1945, and the long-term effects of these bombings are still felt today.

Overall, nuclear explosives represent the most powerful and destructive form of explosive ever created, and their development and use have had a profound impact on world history and international relations. It is important that we continue to work towards disarmament and non-proliferation to reduce the risk of nuclear war and to promote peace and stability in the world.

**Conclusion**

In conclusion, chemical explosives have evolved significantly from the early use of unstable gunpowder to the development of powerful but stable high explosives like TNT and plastic explosives, and eventually to the immense destructive power of nuclear weapons. The discovery and development of various chemical explosives has enabled tremendous changes in engineering, construction, mining, and warfare over the centuries. However, the immense destructive potential of explosives, especially newer and more powerful ones like nuclear weapons, also poses huge risks if misused. As such, regulating and limiting the spread of powerful explosives remains an important issue.