



Prize Winner

Science Writing

Year 5 - 6

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Greek Fire - An Unstoppable Force

The Fire

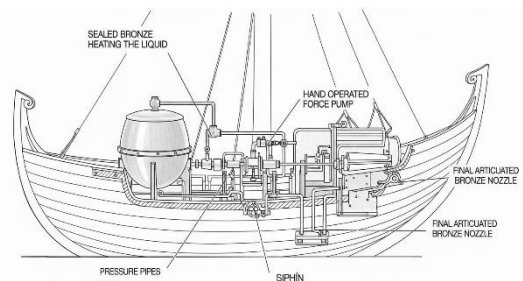
I stood on the deck, my hands gripping the wooden rail so tightly my knuckles turned white. Our massive Roman warship was moving as fast as the rowing crew could push it, but it wasn't fast enough. A terrible screeching sound ripped through the dark night sky. I looked up and froze. A stream of blazing, bright green liquid was flying through the air like a roaring dragon. It hit our deck with a loud splash, and instantly, everything was on fire. Our captain screamed to jump, but I couldn't move. My friends threw themselves into the ocean, but the water didn't put the flames out. This was Greek fire, a terrifying magical weapon. It actually fed on the sea, burning fiercely right on top of the waves. It was an unstoppable force of nature, swallowing our proud ship whole. I knew there was no fighting it, we could only run.



Source: Darkageshistory.com

How Greek fire was invented

The discovery of this ancient weapon took place in the Byzantine Empire, in the year 672 CE. A clever inventor and scientist named Callinicus wanted to save his city, Constantinople from enemy ships. He experimented with different natural liquids until he created a secret weapon that became known as Greek Fire. This amazing invention was essentially the world's very first liquid flamethrower. The army placed this secret liquid inside large bronze tanks on the front of their warships. They used mechanical hand pumps to squeeze the liquid out through long metal tubes called siphons. Just as the liquid shot out of the end of the tube, a small flame lit it on fire. It shot huge, roaring waves of fire across the ocean waves directly onto enemy boats. The kings made the recipe an absolute secret to keep it safe, so the exact recipe was lost forever.



Source: Vertexdigest.com

The main ingredient

Scientists today believe the main ingredient was a natural, oily liquid called naphtha. This is a special type of crude oil that can be found seeping out of the ground in the Middle East. Oil is an excellent fuel because of how it is made. In science, a fuel is a material that has a large amount of chemical energy. When you give this oil fuel a spark, it causes a physical and chemical change called combustion, which is the scientific word for burning. This chemical reaction quickly changes the stored chemical energy into heat energy and light energy. This

creates the giant, glowing hot flame that terrified enemy sailors. Oil always needs oxygen gas from the surrounding air to keep burning brightly.

Making the fire sticky

If the inventor had only used regular crude oil, the liquid would be far too runny. It would just splash off the enemy boats and slide harmlessly down into the ocean water. The inventor needed to change how the liquid behaved, so he mixed in natural items like tree resin and sticky pitch. Tree resin is the thick, sticky sap you find on pine trees. Mixing this sticky resin into the oil changed the physical properties of the liquid. It made the entire mixture very thick, gooey, and syrupy. Because it was so sticky, the burning liquid glued itself tightly to the wooden boats and the cloth sails. This meant the enemy soldiers could not wipe or scrape the fire off, causing the boats to burn down to the water.



Source: Blogspot.com; Canva

The secret of burning on water

The most amazing thing about Greek fire was that it could burn right on top of ocean water. Usually, pouring water on a fire cools it down and puts it out completely. Greek fire was different because of two very clever science rules. First, oil and water are different densities and do not mix together. Oil is lighter than water, which means it floats on top of the waves instead of sinking to the bottom. The burning oil stayed safely on top of the water where it could still get plenty of oxygen from the air. Second, scientists think the recipe used a rocky powder called quicklime. Quicklime has a special chemical reaction when it touches water. Instead of cooling down, it gets extremely hot and creates its own heat. When Quicklime (Calcium Oxide) combines with water (H_2O), it becomes Calcium Hydroxide. It is not the end product that generates heat, but the exothermic process. So, when enemy soldiers threw ocean water onto the Greek fire, the water actually made the chemical reaction hotter! The only way to stop the fire was to smother it with heavy sand or dirt.



Source: Vecteezy.com

Conclusion

Greek Fire was a revolutionary invention that completely reshaped the medieval world by saving an entire empire. By acting like a real-life flamethrower that could burn right on top of the water, this incredible chemical weapon gave the Byzantine military an unbeatable

advantage. It successfully defended kingdoms, terrified invaders, and won historic naval battles that altered the course of human history. Even though the top-secret recipe was lost to time, Greek Fire stands out today as one of the most powerful and fascinating scientific breakthroughs of the ancient world.

Word count: 830

References

Websites:

1. <https://www.britannica.com/technology/Greek-fire>
2. <https://www.rmg.co.uk/stories/maritime-history/greek-fire>
3. <https://www.chemistryislife.com/the-chemistry-of-greek-fire>
4. https://penelope.uchicago.edu/Thayer/E/Journals/USSM/1/1/Greek_Fire_and_Other_Inflammables*.html
5. https://www.researchgate.net/publication/332510588_The_Mystery_of_Greek_Fire_used_by_the_Byzantine_Empire_A_Chemical_Perspective
6. <https://worldtreasures.org/blog/mystery-of-history-what-was-greek-fire>
7. <https://greekreporter.com/2026/06/09/greek-fire-byzantine-empire/>

Books:

8. Greek Fire, Oliver Taplin, Cape, 1989
9. Greek Fire, Poison Arrows, and Scorpion Bombs, Adrienne Mayor, Princeton University Press, 2003
10. Greek Fire Facts for kids, Kiddle Encyclopaedia

Videos:

11. Greek fire is every sailor's nightmare, HISTORY
12. How Greek fire was used to target enemy ships, The Smithsonian Channel

Photos:

1. Darkageshistory.com
2. Vertexdigest.com
3. Blogspot.com; Canva
4. Vecteezy.com