For each advancement, complete one note or illustration about the technology in the appropriate box.

“Code” each advancement: W- Weapons A – Ammunition M – Medical C – Communication T - Transportation

**“Firsts” of the Civil War**

Submarine successfully used in battle

Used on by CSA. 8 man crew turned hand cranked propeller. Candle for light and loss of oxygen. CSS Hunley sunk USS ironclad by ramming it with a “torpedo”. Was first sub victory in history.

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Minie Ball

Most common ammunition. Made of soft lead. Cheap easy to mass produce. Accurate to 200-300yd. Caused 90% of all deaths on the battlefield. Shattered bone and ripped through flesh.

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Military Railroads

1st RR used for Military purposes. Began as a 7mi stretch around D.C. Congress allowed the seizure/control of RR in N&S. USMRR buy, build, capture network of 2,000 miles of Southern lines and over 400 locomotives, 6,000+ cars

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Photography of battles

Lincoln gave permission to photographers to follow troops in a “short and glorious” war. The battle too chaotic/dangerous. Process was too delicate and laborious- glass, alcohol, ether, silver nitrate, sulfuric acid. Required 5-20sec of exposure impossible for action shots. First shots of camps, aftermath, prep…

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Aerial Reconnaissance

Union used them successfully. 1000ft in air could see approx. 7-8 miles away. Union were better organized and also used telegraphs to report. Carried 1-5 men. Was tethered to the ground. Filled with sulfuric acid and iron filings to make hydrogen.

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Telescope sight for rifles

Both sides used “sharpshooters”. Accurate up to 550yd. Used achromatic lenses to limit color refraction and improve clarity. Had adjustments for windage and elevation. 3X-20X power.

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Railroad artillery

Large artillery mounted, transported and fired on railway wagon. Both sides used. Confederates more successful. Lee defends Richmond against McClellan with them.

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Naval mines

Both sides used but CSA to much greater success. Destroyed dozens of US ships, CSA only loss 6 ships. Mines were placed around southern ports to stop actions of blockades.

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Repeating rifles

Used more in the union. Breach loading weapon. 7shots used lever to reload ammunition. Could shoot 20 rds per min compared to 2-3rds/min. 500 yd range. 200,000 built in N – helped union win Gettysburg – overwhelmed south.

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Portable telegraph units on battlefield

US military followed troops with specially equipped wagons, setup poles, strung wire. Used battery wagon for portable telegraph. Mules carried spools of wire. Would communicate using code to other site or even Lincoln near White House.

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Ironclad ships

Stem propelled. Wooden ships with iron/steel armor plating. Both USA, CSA built them. Union used them in ocean and in MS river. US had more then CSA. 1st battle CSS Virginia/USS Monitor rammed each other.

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Dart-tailed Hand Grenades

Called Ketchum grenades. Thrown like a dart and nose must land first to detonate. Would kill several men on impact. One occurance- CSA caught them in blankets and threw them back.

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Army ambulance corps

1st organized transport of the wounded. Ambulance with stretcher would collect wounded from field to field hospital for immediate help then to larger hospital. Established routes and frequent stops. Consistent of wagon pulled by horse and unfit soldiers. Only in Union.

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Functioning machine gun

12-15 guns used by the union. Less by the CSA. 175 rounds per minute. 1200yd range. Worked with a hand crank as gravity fed the chambers as it rotated. Mostly seen as untrustworthy and rarely used in battle, malfunctioned often.

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Wide-scale use of inhaled anesthetics

Chloroform and ether were used. Chloroform more popular cuz faster acting and not flammable. Used inhaler device or towels. Used mostly for amputations to reduce the pain and shock. Nearly 80,000 union operations used it.

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Anti-personnel landmines

Created by the CSA. Buried thousands around Richmond and throughout deep south. Made of iron and gunpowder. Was set off with trip wire or pressure. Viewed as unethical and murder not war. CSA prisoners were made to walk in front of union troops to trigger mines.

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Rimfire ammunition

Fixed ammunition with cartridge, bullet, casing, gunpowder contained together. Used in repeating rifles. Saved on loading time for weapon. Made of brass. Union produced more. Copper mine was in control of union.

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Amputation of limbs to save wounded

Treatment for severe injuries to limbs, shattered bones. Remove limb rather than attempt to fix wound/injury and worsen infection. Within 24hrs. ¾ of all operations were amputations. 70% of injuries were to limbs10min procedure. 28% mortality rate.

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Rifling of ammunition

Used along with Minie Ball. Added velocity, range and accuracy. Smooth barrel range was 50yd – Rifled range was 300yds. Produced more and faster in the North. About 2 million made for the union.

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Napoleon Field Gun

Used by both sides. Most popular field artillery. Shot a 12lb cannon ball. Transported behind horses. Viewed as safe, reliable. Had superior killing power at close range. Range of 1600yd.

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