Research Topic-Military Technology – Communications

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Grade Level	9th – 12th grades
Time Required	1 class period (60 minutes)
Ohio's Learning Standards S.T.E.M.	American History – Topic: Social Transformations in the United States (1945-1994). A period of post-war prosperity allowed the United States to undergo fundamental social change. Adding to this change was an emphasis on scientific inquiry, the shift from an industrial to a technological/service economy, the impact of mass media, the phenomenon of suburban and Sun Belt migration, the increase in immigration and the expansion of civil rights.
Common Core Standards	CCSS.ELA-LITERACY.RH.9-10.2 Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text. CCSS.ELA-LITERACY.RH.11-12.1 Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole.
Objective	Students will discuss and gain an understanding of the rapid technological advances of the first half of the 20th century. This period, defined by the tensions between industrialized nations, resulted in World War I and set the Stage for World War II.
Research Statement	**Communications by armed services personnel involve the transmission of military messages, orders, and reports, both in the field and at sea, between headquarters and distant installations or ships, and personal communications to family members and friends. Traditional tactical communications have come from specialized individuals or locations that were hubs for information exchange using land links or, more recently, a combination of ground and UHF satellite communication uplinks. However, change will happen because of product improvements and new products being developed by vendors.**
Introduction	One of the earliest forms of military communication was created during the time of Alexander the Great, Hannibal, and Caesar. They used horses to deliver messages from one messenger post to another. Genghis Khan enhanced this system by training and using homing pigeons to transfer messages instead of horses. In the 18th century, European armies began using a visual telegraph system called the Semaphore which was invented by Claude Chappe in 1794. This system used "semaphore" – a flag-based alphabet – and depended on a line of sight for communication. From this point forward, military communication continued to advance and evolve to suit the needs of the military and reflect the technological accomplishments of each century.

Supporting Idea I	In 1830, Morse Code, which relied on a series of dots and dashes, began revolutionizing long range communication. In 1876, Alexander Graham Bell invented the telephone allowing people to communicate while in separate rooms. While at first it could only be used at short range; but by 1998, practically in every household in America had a telephone. The U. S. Army's use of the telephone was limited during the Spanish-American war but would later be used in both World War I and World War II. In early to mid-1890's wireless communication (radio) was invented and, by 1914, was adopted and in extensive use by all armies and navies of the world. Technological developments in wire and wireless communication accelerated in the 20th century. These advancements include: Television (1926), satellite communication (1962), and the World Wide Web (1990). By the 21st century, technological advancements include 3G communication (early 2000's), and 4G communication (2009). These advances in technology, initially created in the late 19th century, caused the Army to work continually to develop a technically and fiscally feasible, effective, and suitable air-land tactical network that met the needs of the military.
Supporting Idea II	Established in 1863, The United States Army Signal Corps (USASC) is a division of the Department of the Army whose mission is to manage all aspects of communications and information systems support. The Signal Corps contains several highly technical jobs dealing with communications methods including civil ones. To some extent, occupations in every military branch (Air Force, Army, Coast Guard, Marines, Navy and the Reserve components of those branches) operate forms of communication ranging from less complex text, audio, and tactical ground-based communications to more intricate Wi-Fi and Li-Fi technologies, terrestrial microwave, tropospheric scatter, naval, satellite communications systems and equipment, surveillance and signal analysis, encryption and security, and direction finding and jamming.
Supporting Idea III	In addition to defense communication needs, deployed military personnel have a personal need to communicate with their families and friends. Today, as in years past, communication via telephone and the exchange of cards or letters is a morale booster. However, these methods have been supplemented. During the Korean and Vietnam Wars, ham operator networks were used to complete long distance telephone calls to the States. Also, during the Vietnam War, deployed personnel, and those with whom they corresponded, purchased small tape recorders to mail recorded messages back-and-forth. Now, when security precautions permit, personal communications have been enhanced through the use of mobile devises and apps like Skype, WhatsApp, Viber, and social media.
Conclusion	Like civilians, the military wants communications devices that are smaller and lighter and cover more band width to carry more voice and data than is currently available. In the future, nanotechnologies, Quantum computing and further improvements in Wi-Fi and Li-Fi will provide discoveries, innovations, and solutions to problems, as well as

	careers that have not even been imagined. As is the case today, these careers are certain to require knowledge, skill, and ability in science, technology, engineering, mathematics (S.T.E.M.) academic subjects.
Important Figures	1. Navajo Code talkers: Veterans, Native Americans 2. Alexander Graham Bell: Inventor, American 3. Samuel Morse: Inventor, American 4. Alfred Vail: Inventor, American 5. John Goodenough: Inventor, American, Veteran, World War II 6. Wilson Greatbatch: Inventor, American, Veteran, Radio man, World War II
Resources	Military communication • Author: George I. Back and George Raynor Thompson • Published: April 25, 2018 • Link: https://www.britannica.com/technology/military-communication *Revolutions in Communication 2nd Edition* • Author: Bill Kovarik • Publisher: Bloomsbury Academic • Copyright: November 19, 2015 • Page length: 480 • ISBN: 978-1628924787 • Grade level: 9th-12th US Navy Training Video - Technique of Hand Sending Morse Code (1944) • Author: Carl Lewis • Published: July 28, 2011 • Link: https://www.youtube.com/watch?v=YQyP7VJqvqE • Time: 12:11
Visual Thinking Strategies	Visual Thinking Strategies transform the way students think and learn by providing training and curriculum that facilitate discussions of visual art which significantly increase student engagement, performance, and enjoyment of learning. https://vtshome.org/about/
Assignment	Have students take 3-5 minutes to look at the images. 1. Ask students to describe what they see in the images. 2. Ask students what more they can tell you about the images. 3. Ask why?
Assessment	Using visual cues, students should observe and discuss people, the way individuals are dressed, the activity of individuals, if individuals look familiar, landscapes, backgrounds, etc. Students should be able to articulate what they see in each image using visual thinking strategies.
Critical Thinking Questions	1. In addition to those found in S.T.E.M. curricula, what other knowledge, skills, or abilities are essential to military communications? 2. What are some reasons mobile devices like iPhones cannot be used for military communications in a war zone?

	3. Other than mobile devices like iPhones, what do you imagine are ways that mobile military communications could evolve? Be creative!!!
Images	 At National Veterans Memorial & Museum

Title: "Send more men." Won't you answer the call / Stone Ltd.
Summary: Poster showing a soldier using telephone apparatus.
Created / Published: Toronto: Central Recruiting Committee, No. 2 Military Division, [1915]
Subject Headings
- World War, 1914-1918--Recruiting & enlistment--Canada
- World War, 1914-1918--Equipment & supplies--Canada
- Soldiers--Canadian--1910-1920
- Communication devices--1910-1920
Format Headings: Lithographs--Color--1910-1920. War posters--Canadian--1910-1920.
https://www.loc.gov/pictures/item/2005695793/

English: From back of photo: Telephone Switchboard. L to R: PVT Harry Ross, PFC Thomas J. Sockwell, PVT Symeone E. Dyer, 372nd Ind. Hqrs Det., Columbus, Ohio.
https://commons.wikimedia.org/wiki/File:3_men_working_on_a_portable_phone_switchboard.jpg