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“Technology is a key factor in winning a war.” With reference to WWI, explain to what extent you agree with this statement.

World War I lasted from 1914 and 1918, and was fought between the Central Powers consisting of Germany, Austria-Hungary and the Ottoman Empire, against the Allied Powers consisting of Britain, France, Russia, and the US, which entered the war in 1917. This war was stalemated after the ‘race to the sea’ in the Western Front. Winning the war required this stalemate to be broke, and the Allies successfully did this. This victory can be attributed to larger amounts of resources and manpower that the Allies had, and the superior tactics used by the Allies as compared to the Central Powers. However, this victory cannot be attributed to technology, because there was equal technological strength on both sides, and this did not break the stalemate. Instead, resources and manpower were the most important factors in this victory, more so than technology, because they were crucial to both sustaining the stalemated war, and supporting tactics that helped to break the stalemate.

Technology was not a key factor in the Allied victory. While there were advancements in the technology in the war, supported by the highly industrialised economies of the countries involved, these were not enough for either side to gain advantage over the other. The Germans first developed poison gas, deploying chlorine gas in 1915 at the Battle of Ypres. Carried by wind, the gas caused much panic among the Allied soldiers and disabled 6.5 kilometres of trenches. However, in response, this development was adapted by the French, who developed their own phosgene gas, which was first used in 1915. Thus, both sides were able to match each other evenly in chemical weaponry. Furthermore, the development of gas masks on both sides reduced the impact of these weapons on soldiers. Meanwhile, tanks were developed first by the British and French, of which 49 were first used in the Battle of the Somme. These tanks were able to advance ahead of the infantry, crushing barbed wire and attacking the enemy with machine gun and cannon fire, to bring mobility to an otherwise static war. In addition, the crew of the tanks were protected by armour from small arms fire. However, these tanks were slow and unreliable and many tanks broke down before they reached the German trenches, and their armour plating was also not strong enough to resist artillery. Hence, tanks, which were still in their infancy when they were introduced, were not able to make a significant impact on the course of the war. The use of submarines was initially an advantage for the Germans, who had the most advanced ones, the U-boats, and these managed to cause Britain the loss of 464,000 tonnes of shipping in 1917 and another 834,000 tonnes in the later part of the year, threatening British supply lines. Despite this advantage, Germany’s use of submarines to cripple British resources failed as the Allied Powers began to use the convoy system in April 1917, where merchant ships were protected by warships. These escorts deterred German U-boat submarines from using guns on the surface. Weapons technology also progressed so that surface vessels could locate and attack U-boats even when they were submerged, such as through the hydrophone passive listening device. Therefore, the introduction of submarines failed to give the Germany an advantage over the Allies. Overall, development of new tactics and technologies, and the inherent limitations in the weapons that were developed, led to technological parity on both sides of the war. As Peter Riddick argues, the absence of ‘super-weapons’ capable of overcoming the advantages of defence contributed to the stalemate. As technology was unable to break the stalemate, technology was not a key factor in Allied victory.

On the other hand, resources and manpower was a key factor in the Allied victory, more so than technology. In the stalemate, continuous supply of resources and manpower was critical in sustaining the war effort. The Central Powers were in a less advantageous position than the Allies in this regard. Germany had weak allies like Austria-Hungary and the Ottoman Empire, who were

dependent on Germany for resources. This stretched German resources in the war. Adding to the strain was the British blockade on German ports, which denied the country vital imports of food and raw materials. Britain had declared the North Sea as a military area in which all merchant ships could be searched to ensure that Germany and its allies were not getting supplies via other countries. The greater naval strength of the British Royal Navy compared to the German High Seas Fleet, along with the failure of the German U-boats to impose their own blockade on Britain, meant that Britain could sustain a distance blockade. Thus, as Peter Riddick mentions, Germany was on the point of economic collapse and the shortage of food was acute, such that "there were instances of people eating rats, dogs and cats". In comparison, the Allies were more secure with their resources. Britain and France could draw on the support of large overseas empires and were able to maintain their access to overseas trade routes. France could rapidly improvise factory production of munitions, becoming an indispensable supplier of its allies, and this included over three-quarters of the field artillery, tanks and aeroplanes used by US forces. This stability in the supply of resources was further supported by the coming of the US to the Allies' side in 1917. By 1917, American companies had lent \$2.5 billion to the Allies. Even at the start of the war, there was already a vast inequality of resources present between the Allies and the Central Powers. The Central Powers' share of world manufacturing was just over 19%, while for France, Britain and Russia combined they had almost 28%, and for the US, 32%. Combined, the economic conditions for the Allies were much more advantageous than for the Central Powers. The overstretched German economy failed to support Germany's attempt to break the stalemate through the Ludendorff Offensive in March 1918. Germany wanted to take advantage of the collapse of the Russian army and sought a knockout blow in the Western Front. Through the offensive, the Germans came close to 40 miles from Paris, but the Hundred Days Offensive launched by the Allies in July was more amply supported by logistics. In comparison, German troops suffered from a lack of sufficient reserves, poor logistics and collapsing discipline. After the Ludendorff Offensive, while Germany was suffering from a loss of 500,000 casualties, on the side of the Allies, sheer numbers of fresh troops were arriving from the US. Manpower-wise, Germany had already been at a disadvantage because the needs of the war time industries at home led to the release of thousands of men from front line military service to work in munitions production with damaging effects on the strength of the German army. Thus, the Allied Powers were able to force the Germans to retreat, and under pressure from its allies' surrender, Germany surrendered on 11 November 1918. In the war, the Central Powers faced a lack of resources and manpower as compared to the Allies, so they could not sustain the war effort through the stalemate, and were unable to decisively break the stalemate as the Allies did with their offensive. In this way, resources and manpower were key factors in breaking the stalemate and to the Allied victory, unlike technology, which merely contributed to the Allied victory.

Tactics were also a key factor in the Allied victory, more so than technology. The Central Powers did adopt some good tactics. For much of the war the German troops displayed greater tactical ability in the trench war such as through the use of storm troopers, or small groups of highly trained soldiers whose purpose was to *penetrate enemy lines at weak points*. When the Germans launched the Ludendorff Offensive, they used a combination of innovative tactics, notably the use of stormtroop units, the offensive was able to achieve initial success, catching the British forces unprepared and advancing an impressive 60 kilometres into Allied-held territory. However, tactically, the Germans failed to convert the initial 'break in' into a decisive breakthrough and the troops had suffered heavy losses. On the other hand, the Allies were able to push back the German advance through tactical innovation, which enabled the British, French and American forces to sustain an impressive campaign through the summer and autumn of 1918 in the Hundred Days campaign. This drew on constant efforts by the Allies to improve their tactics. By 1918, for instance, the British forces had a

much firmer grasp of the necessary interrelationship between artillery and infantry and were able to better integrate new technology such as the tank and the aeroplane, more effectively into the conduct of battle. Under the Allies, the creeping barrage tactic was perfected, enabling infantry to advance under cover of a moving curtain of heavy gunfire, keeping German forces pinned down and unable to retaliate as the attackers moved forward. This was more effective than the tactics employed earlier in the war, in which troops attacked after a prolonged bombardment of German positions had taken place, a procedure that gave notice of the impending assault and resulted in heavy infantry casualties. These improvements in tactics allowed the Allies to challenge the Central Powers on the battlefield, and gain an advantage during the Hundred Days' Offensive and pressure the Germans to surrender. As the use of better tactics allowed the Allies to push back the Germans from their positions in 1918, ending the stalemate in their favour, while technology only allowed it to continue, tactics were more important than technology in the Allied victory. At the same time, tactics is a less important factor than resources and manpower in the Allies' victory during World War I. It was only because of the larger amounts of resources on the Allies' side that they could sustain their superior tactics against the Germans in the Hundred Days. In this decisive campaign, tactical innovation was supported by increased quantities of artillery, ammunition and manpower. It was resources and manpower that enabled tactics to be effective. Hence, in all, while tactics are a more important factor than technology in the Allied victory, they pale in importance to that of resources and manpower.

In conclusion, technology was not a key factor in winning World War I. Due to the technological parity between the Allies and the Central Powers, and the inherent limitations in some of the new technologies that emerged, technology failed to break the stalemate in the Western Front and allow for Allied victory. In contrast, resources and manpower are key to the Allied victory, more so than technology, because in the stalemated nature of the war on the Western Front, having resources and manpower to sustain the war effort became ever more important. The Central Powers lacked the advantages in resources and manpower that the Allies had, and failed to sustain the war effort. In the short term, this led to the failure of the Germans in using the Ludendorff Offensive to break the stalemate in their favour, while the Allies, supported by the American resources and manpower, could provide an effective counter-offensive to push the Germans back and pressure them to accept defeat. Resources and manpower helped the Allies to win a victory, but technology did not as it sustained the stalemate. Meanwhile tactics were also more important than Allied victory in the war, but in turn, resources and manpower were more important than tactics in the victory. This is because while superior tactics gave an advantage to the Allies, it was only because of an advantage in resources that these tactics could be carried out effectively.