

## Air Power in World War I

### Quick Write



Faced with seven German planes against his one, Eddie Rickenbacker knew he must remain calm. Why do you think that was important? What lesson do you think you can learn for use in emergencies you might face?

### Learn About...



- the contributions of US pilots during World War I
- the role of air power during World War I
- how air power expanded during World War I

**Edward Rickenbacker** was an American combat pilot during World War I. He shot down 26 German airplanes in just five months. He was the only surviving pilot of that war to receive the Congressional Medal of Honor during his lifetime.

Rickenbacker earned his medal for an act of bravery on 25 September 1918. He was flying alone when he came across seven German planes—five Fokker D-VIIs and two Halberstadt CL-IIIs. When facing such situations, he knew a pilot must remain calm. And he certainly must have done so. Defying the huge odds, he shot down two of the seven enemy planes.

Rickenbacker was one of the American “aces” in the war. The French came up with the title of ace for any pilot who had knocked five or more enemy planes out of the sky over the course of the war. The Germans, however, insisted their ace pilots bring down at least 10 aircraft to earn the title. An “ace of aces” was the pilot from each country who had taken down the most enemy aircraft. France’s ace of aces was René Fonck. He had 75 kills, or planes shot down. Edward Mannoock, with 73 kills, took the prize in Britain. And Baron Manfred von Richthofen of Germany (known as the “Red Baron”) shot down 80 airplanes. Rickenbacker, with 26 kills, was America’s ace of aces.

**EDWARD RICKENBACKER** was America’s ace of aces. He shot down 26 planes during World War I.

Courtesy of Bettmann/Corbis



## The Contributions of US Pilots During World War I

### Vocabulary



Despite the contributions of brave pilots on both sides, most World War I battles were fought on land or at sea. Airplanes were still fragile when the war started in 1914. After all, the Wrights didn't make their historic flight until 1903.

But during the war, aviation engineers made tremendous advances. Some American commanders in the field had great faith in the capabilities of the Aviation Section of the Army's Signal Corps. In a few key instances, aircraft contributed to the Allied victory. Aircraft had important functions—from doing aerial reconnaissance to shooting down enemy aircraft.

### The Outbreak of World War I

World War I began in Europe, when a Serb assassinated Archduke Franz Ferdinand on 28 June 1914. Ferdinand was next in line to the Austro-Hungarian throne. Because of alliances among different nations in Europe, one country after another soon declared war.

First Austria-Hungary declared war on Serbia. Then Russia entered the fray on Serbia's side. Germany, which had ties to Austria-Hungary, was the next to step into the conflict by declaring war on Russia. Soon *Russia, France, Serbia, and Britain*—the **Allies**—were at war against *Germany, Austria-Hungary, and Turkey*—the **Central Powers**. (Many other countries later joined the fight, including the United States and Italy on the side of the Allies. Russia withdrew from the war after the Russian Revolution at the end of 1917.)

When Germany invaded France on 4 August 1914, the war started in earnest.

American President Woodrow Wilson vowed that the United States would remain neutral. But over time, that proved impossible. German **U-boats**—*German submarines*—attacked American ships in the Atlantic because the United States was sending goods to Britain. Wilson asked Germany to stop sinking American ships. And for a while, Germany did.

But in early 1917 two things happened. Germany once again targeted all American ships headed toward Britain. And in a telegram discovered by British intelligence, Germany asked Mexico to make war with the United States if the United States did not remain neutral. If Mexico joined the war and the Central Powers won, Germany promised Mexico it could have Texas, Arizona, and New Mexico.

President Wilson asked the US Congress to declare war on Germany. Congress agreed. The United States entered World War I in April 1917.

The use of airplanes as weapons took major leaps forward during that war. The heroic central figure in air power was the pilot.

- Allies
- Central Powers
- U-boat
- escadrille
- machine gun
- stalemate
- appropriate
- strategic
- zeppelin
- dogfight
- strafe



## The Contributions of World War I Pilots

Four American pilots in particular made their marks during World War I, also known as the Great War. But it all began with a group of US pilots who together formed the Lafayette Escadrille in France.

### THE LAFAYETTE ESCADRILLE

Some American pilots didn't wait for the United States to join the war. They tried to enter the military services of the Allies. For legal reasons, most countries couldn't accept the men's offers. But France, with its French Foreign Legion made up entirely of fighters from outside France, could sign up these volunteers.

In April 1916 seven American pilots formed a fighting group that they called *Escadrille Américaine*. An **escadrille** is a small squadron of planes. The pilots were wealthy young men who had been living in Paris. In the next few days seven more Americans, then serving in French units, joined the squadron.

When the men of *Escadrille Américaine* began racking up German kills, Germany protested. It said that the United States was breaking its promise of neutrality. The men had to change their group's name.

They decided to call it the Lafayette Escadrille. Its name honored the Marquis de Lafayette, who fought for the 13 American colonies during the Revolutionary War. Now individual Americans were fighting on behalf of France and the Allies in the war against the Central Powers.

In the escadrille's first five months, its pilots fought in 156 air battles and shot down 17 enemy planes. By the time the United States Air Service brought the unit under its supervision in 1918, its pilots had made 199 kills. Six members were aces. Forty died by the war's end. The escadrille included Eugene Bullard, the only African-American to serve as a pilot in the war.



#### THE LAFAYETTE ESCADRILLE, 1916

Members of the Lafayette Escadrille with their mascots, which included a lioness and a lion cub.

Courtesy of Bettmann/Corbis

## RAOUL LUFBERY

Raoul Lufbery was the most famous pilot of the Lafayette Escadrille. He had 17 combat victories during the war. A native of France, he came to the United States as a child and became an American citizen. As a young man, he tried the US Army but didn't care for the discipline. During travels abroad, he met Marc Pourpe, a French pilot. Pourpe took him on as his mechanic. Together they traveled to India, China, and Japan.

The pair was in France when war broke out. Lufbery followed Pourpe into the military by way of the French Foreign Legion. He continued working as Pourpe's mechanic. No doubt he was also listening to the pilots talk about effective combat maneuvers and flying techniques. When Pourpe died in action in 1914, Lufbery trained to be a pilot. He signed up with the Lafayette Escadrille shortly after it was established.

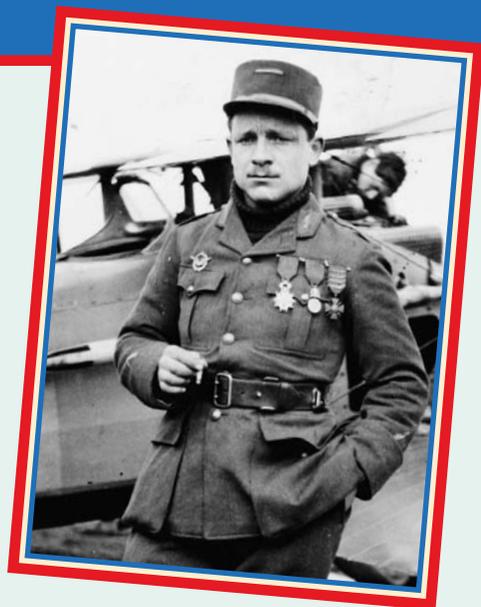
Lufbery used to give two pieces of advice to new combat pilots. First, he said, don't lunge headfirst into combat. Take stock of the scene before committing yourself. Second, he cautioned that a pilot in a burning plane would have a better chance of survival if he tried to bring it in for a landing. Parachutes were not standard equipment in those days, so pilots couldn't safely jump from a damaged aircraft.

Sadly, Lufbery was not able to follow his own advice. When a German aircraft shot Lufbery's plane on 19 May 1918, his aircraft became engulfed in flames. Lufbery jumped to his death.

## EDWARD RICKENBACKER

America's ace of aces started out as a professional racecar driver. He competed in the Indianapolis 500 three times. Rickenbacker learned a lot about automobiles through an engineering correspondence course. He also worked at a car-manufacturing company. Like Glenn Curtiss, who'd broken speed records on motorcycles, Rickenbacker set a record in a racecar. His top speed was 134 mph.

Although he was making excellent money as a racer, Rickenbacker wanted to be a part of the war effort. In 1917, he asked the US Army to consider forming a squadron of pilots made up of racecar drivers. The military didn't take him up on his offer, but they did ask whether he would like to enlist and serve as a staff car driver.



**RAOUL LUFBERY**

Raoul Lufbery flew with the Lafayette Escadrille.

Courtesy of the Library of Congress

Rickenbacker said yes, and fate stepped in. One day while Rickenbacker was driving a member of Gen John J. Pershing's staff, they passed the broken-down car of Col William "Billy" Mitchell, chief of the US Air Service. Rickenbacker pulled over to the side of the road. Drawing on his expertise in engine repair, he fixed the car. Col Mitchell was impressed. Later he asked Rickenbacker to be his driver. Before long, Rickenbacker had Mitchell's permission to train as a pilot.

Rickenbacker rose from an enlisted Soldier to the rank of captain and took command of the 94th Squadron. He did two important things for his men. He got them equipped with parachutes. And he figured out how to keep an airplane's **machine gun**—*an automatic rifle that uses belt-fed ammunition*—from jamming.

## The Ace Who Became an Airline President

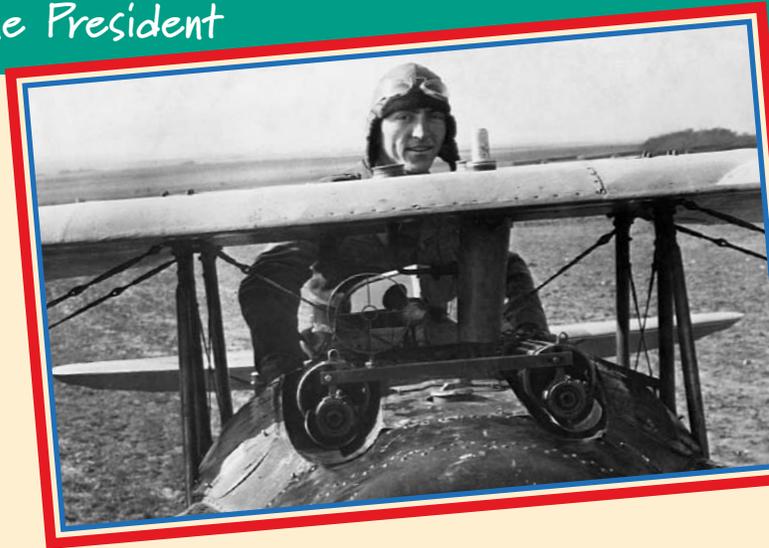
American ace of aces Edward Rickenbacker (1890–1973) didn't slow down when World War I ended. He remained in the reserves and worked his way up to colonel. He also returned to one of his first loves—cars. Rickenbacker founded an automobile manufacturing company.

The personal side of his life flourished, too. He got married and had two children. In 1927, the pace picked up. Rickenbacker, who'd once raced in the Indianapolis 500, bought the Indianapolis 500 Speedway. He sold it after World War II.

Rickenbacker remained engaged in engines, cars, and planes in other ways as well.

He was an aviation advocate. He managed General Motors Fokker Aircraft Company. Next he took on the job of vice president of American Airlines. He eventually left that job to go back to Fokker, where he became manager of its Eastern Airlines division.

Then in 1938, Rickenbacker bought Eastern Airlines. Friends gave him financial support for the purchase. He worked at Eastern for more than 20 years and retired in 1959 as president. He remained as chairman of the board until 1963. Rickenbacker spent the last 10 years of his life promoting aviation, both military and civilian.



**1ST LT EDWARD RICKENBACKER**

A former racecar driver, 1st Lt Rickenbacker of the 94th Squadron is shown here in his Spad airplane on a French field.

Courtesy of Corbis Images

## FRANK LUKE

Frank Luke was a wild card. He didn't have the discipline of a Rickenbacker or a Lufbery. But he did have their guts. He was tough—he came from the Arizona mountains and had worked in copper mines.

As soon as the United States entered the war, Luke volunteered. He chose the Army Signal Corps and completed his nine-week flight training in seven weeks. In March 1918 he went to France as a second lieutenant. After more training, he began to go out on patrols. But he never saw any German aircraft. Running out of patience, he flew solo over a German airfield in August 1918. He met up with six Albatros fighters (a German biplane) and shot one down.

One month later Luke asked permission to go after a German balloon that another squadron had tried unsuccessfully to shoot down. Balloons were always heavily guarded because they were so vulnerable. Another plane went along with Luke to watch his back. Luke got his balloon.

Luke still sometimes went off by himself. Once he disappeared overnight. When Luke returned, his commander grounded him. Luke took off again anyway, even though he risked court-martial. This time he downed three balloons. He also shot some German soldiers on the ground.

He landed his plane later to get a drink of water from a stream. A German foot patrol surrounded him. When he drew his revolver, they killed him.

Luke's career as a combat pilot was short: he died just 17 days after his first kill. In that time, he shot down 15 balloons and three airplanes. It was one of the records of the war.



### 2D LT FRANK LUKE

Frank Luke once shot down three German balloons within 35 minutes. Balloons were among the most heavily guarded aircraft during World War I and were, therefore, extremely dangerous to attack.

Courtesy of Corbis Images

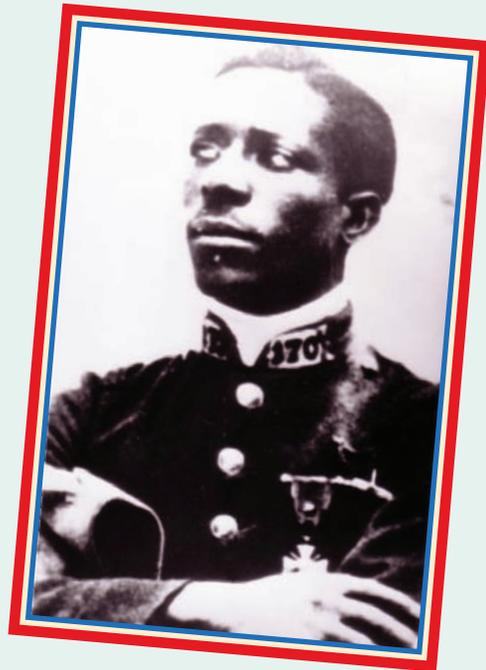
## EUGENE BULLARD

Only one African-American served as a pilot during World War I. His name was Eugene Bullard. Bullard was also one of the few enlisted men to fly an airplane.

Bullard carved his own path throughout his life. When he was only eight years old, he ran away from his home in Georgia. His goal was to get to France. He'd heard France was a wonderful place for people of all races. It took him 11 years, but he finally got there.

Like other Americans wishing to join the fight in World War I, Bullard signed up with the French Foreign Legion in October 1914. He was wounded four times while with an infantry unit whose members called themselves the “swallows of death.” After his fourth wound, he transferred to the French Air Service and became a pilot. He was the first black man to get a pilot's license and the first black American fighter pilot. He tried to join the US Air Service, but the Army turned him down. He shot down two German aircraft while in the French Air Service. Finally, he got into a tussle with a French officer—rather than court-martial him, the French military transferred him back to the infantry, where he served the rest of the war.

Bullard eventually returned to the United States, where he lived in Harlem, New York. The French government awarded him a *Croix de Guerre* (War Cross) medal, which it gave to individuals who displayed heroism during fighting with enemy forces. Bullard also received several other medals for his contributions to the war effort, both in the air and in the infantry. In 1954, France asked him to visit to help light the Eternal Flame of the Tomb of the Unknown French Soldier in Paris at the Arc de Triomphe. This was a great honor.



**EUGENE BULLARD**

Eugene Bullard was the only African-American combat pilot during World War I.

Courtesy of the US Air Force

## From War Hero to Elevator Operator

When Eugene Bullard (1894–1961) hung up his infantry boots at the end of World War I, he returned to Paris. This was the city that felt like home to him. Before the war he'd been a boxer. But now he was a war veteran who'd suffered many wounds. He needed work that exercised his mind more than his body. He went into the nightclub business and met many famous people such as authors Ernest Hemingway and F. Scott Fitzgerald. He also got married. His wife was the daughter of a countess. They had two children. Years passed and another war was brewing—World War II.

During all his time in Europe, the former war pilot had picked up language skills. In addition to English and French, Bullard spoke German quite well. Because Bullard had great affection for his adopted country of France, he agreed to help when the French government asked him to spy on Germans living in France. War broke out in 1939 and with the German army about to take the city of Paris in 1940, Bullard knew he had

to leave. He did this because if he were captured he'd be charged as a spy and because he wanted to protect his two children. Bullard and his wife had separated years before but when she died, Bullard gained custody of their children.

After fleeing Paris, Bullard went with his children to the city of Orleans, south of the French capital. He joined a group of uniformed troops defending that city, and was once again wounded. A woman spy smuggled him and his children into Spain. The family was later sent back to the United States, where Bullard recovered.

Bullard spent the rest of his life in Harlem, New York, working as an elevator operator at the Rockefeller Center. The US military didn't recognize his wartime achievements until after his death, when the US Air Force commissioned him as a lieutenant.

But the grateful French never forgot him. French President Charles de Gaulle even praised Bullard on a visit to New York City in 1960.



**MANFRED VON RICHTHOFEN,  
THE RED BARON**

Courtesy of the National Archives  
and Records Administration

## The Red Baron

Baron Manfred von Richthofen was Germany's ace of aces. He made 80 kills. He came from a wealthy military family. By age 20, he was a lieutenant in a Prussian Army cavalry regiment. But once the fighting moved to the trenches, the horse cavalry no longer had an important role in combat.

So Von Richthofen joined the German Imperial Air Service. He soon commanded a group with scarlet-colored planes. Because of his record of conquests in the air and the color of his planes, he became known as the Red Baron. Allied fire killed Von Richthofen in 1918, three years after he became a pilot.

## US Contributions to the Air War

By 1917, after years of bloody fighting which cost both sides terrible casualties, the war in Europe was at a stalemate. A **stalemate** is a situation in which further action is blocked. The French Army was demoralized. The British tried to reinforce France, but inexperienced replacements composed the bulk of British troops by this point. Germany was also weakening. A force was needed to tip the balance one way or the other. The Allies hoped that force would be the United States, which joined the effort in April.

In August 1917 the US Congress vowed to “darken the skies over Europe with US aircraft.” It voted to **appropriate**—to set aside for a specific use—\$64 million to build airplanes.

Congress had good intentions, but it had made an empty promise. The United States lacked both the engineers to design planes and the manufacturers to assemble them. Even by the end of the war, all American pilots were still flying British or French planes.

Britain and France had entered the war in 1914 with 450 aircraft. Germany at that time had 200. All three countries had working aviation industries in those years. By 1917 France and Germany each boasted more than 2,000 aircraft. Britain was continually flying patrols along the North Sea, but the Allies were running out of steam. At that time, the United States had just one manufacturer: Curtiss Aircraft.

While the United States never built more than a handful of airplanes during the war years, it did provide considerable manpower in the air. It entered the European conflict with 100 pilots and trained 10,000 more before the war’s end in November 1918. In all, 781 enemy planes fell to US aircraft. US pilots took part in 150 bombing raids.

It may have taken America the better part of a year to ramp up its effectiveness in the war, but its support of the Allies was crucial. In one of the most significant air battles of World War I—the Battle of Saint Mihiel—America’s Billy Mitchell led the Allied air attack. That battle determined the war’s outcome.

### CAPSULES

#### *Weakness in the Air: Congress Responds*

August 1917 wasn’t the first time Congress tried to pump up the country’s air power. On 18 July 1914 the US House of Representatives authorized the Army’s Signal Corps to create an aviation branch with 60 officers and 260 enlisted men. When in March 1916 the 1st Aero Squadron took to the field to help Gen John J. Pershing secure the US–Mexico border, the squadron had eight biplanes. But these planes were not nearly powerful enough to get over Arizona’s Casa Grande mountains. Recognizing the need, the Congress appropriated \$13.2 million to build up the Aviation Service.

## The Role of Air Power During World War I

### Enlisted Pilots

The United States entered the war in 1917 with 100 pilots. Billy Mitchell and another officer, Hap Arnold, had done their best to build up the number of pilots by training enlisted men. Both officers thought highly of the enlisted men in the Army's Signal Corps. The enlistees knew aircraft engines inside and out. Mitchell, an outspoken advocate of air power, helped ensure that the National Defense Act of 3 June 1916 included language that authorized the training of enlisted men as pilots.

Until World War I, most people thought the role of aircraft in combat was limited to aerial reconnaissance. Countries won wars based on the strength of their infantries and the power of their navies. That's how it had been for centuries.

When the US Army bought its first *Wright Flyer*, even Brig Gen James Allen didn't think of an airplane as a potential offensive weapon. Dropping bombs from the sky seemed an unlikely idea. Conducting battles between squadrons of planes also seemed far-fetched. After all, planes of those days were built of plywood, and their wings were wrapped in fabric. But World War I would alter the military's views.

While many improvements were still needed to make the airplane the fierce weapon it is today, battlefield strategy evolved dramatically over the course of the Great War. The airplane reshaped the way countries fight wars more quickly than any other weapon in military history. A motto emerged by war's end: "If you control the air, you cannot be beaten; if you lose the air, you cannot win."

### The Significance of Air Power in World War I

You've read that air power was essential to winning World War I. But where was its impact the greatest?

#### The Long-Range Raid and the Machine Gun

London, 1915: German airships floated over the city and dropped bombs with great accuracy. They destroyed buildings and killed many people. Through 1917 the Germans worked on perfecting these long-range strategic raids. **Strategic** means *designed to strike at the sources of an enemy's military, economic, or political power*. The British were really the first to attempt a long-range raid. In 1914 they targeted hangars housing German aircraft.



### A GERMAN ZEPPELIN

World War I German airmen dropped bombs on French and English cities from German zeppelins.

Courtesy of the Library of Congress

The Germans flew hydrogen-filled zeppelins. A **zeppelin** is a German dirigible with a rigid frame used for observation and bombing raids. Zeppelins, invented by the German Count Ferdinand von Zeppelin, had one major weakness: they easily burst into flames when hit by anti-aircraft fire. So the Germans built a twin-engine bomber called the Gotha IV. The Gotha IV went on bombing raids over many British cities in 1917.

As a result of these raids, Britain had to take new measures to protect its own shores. English fighter squadrons were ordered to return from France so that they could guard British soil.

## CAPSULES

### Bombs on Britain

It wasn't a zeppelin that dropped the first bombs on Britain. It was a German FF-29 seaplane. The date was 21 December 1914, and the target was Dover, a city in southeast England. The FF-29 missed its target that day. But three days later it raided Britain a second time. Its bombs hit Dover this time, but no one was killed. The next day the aircraft invaded British airspace a third time. It dropped two bombs on nearby Kent. Over the course of the war, Germany hit London alone with 56 tons of bombs. German aircraft dropped 214 tons of bombs on the rest of the country.

## Skynotes

### The First Independent Flying Force

In response to German air raids on English cities and factories, the British formed their own bombing unit. Although the British were the first to conduct a long-range raid, they hadn't established a new arm of their military to do so. But in 1917 the British Royal Flying Corps (RFC) founded its first bombing wing. Unlike American and other Allied aviation units, the RFC did not answer to an infantry officer. It was independent. In 1918 the RFC merged with the Royal Naval Air Service and became today's Royal Air Force.



### THE GERMAN *ALBATROS* D-II

The German *Albatros* D-II had two machine guns mounted toward the front.

Courtesy of the EAA/Jim Koepnick

Another innovation dreamed up by the Allies and picked up by the Germans was the airplane-mounted machine gun. Machine guns had been around since the late 19th century, and they were in full use by infantrymen from the start of World War I. They weren't used right away in the air, however. Until 1915 pilots shot at one another with pistols and rifles. French pilot Roland Garros first bolted an automatic rifle to his plane so he could shoot straight through the propeller. To keep from shooting his propeller off, he attached steel plates to the backs of the blades.

The Germans got to see Garros's deadly invention up close when they downed his plane in April 1915. They asked a Dutchman, Anthony Fokker, to take the design a step further. Fokker built an interrupting gear. He hooked the machine gun to the plane's engine. In this way, the gun would not fire while the propeller was in the way. For the next year, the Germans ruled the skies.

But if the Germans could capture and copy Garros's design, it was only a matter of time before the Allies captured a German aircraft and copied Fokker's interrupting gear. In April 1916 the Allies did just that. Soon the Allies and the Central Powers were again on equal footing. The famous dogfights commenced. A **dogfight** is a battle between fighter planes. The fighter aces came out of these aerial battles. Sometimes squadrons with as many as 50 planes faced off.

### The Battle of Saint Mihiel

In September 1918 the Battle of Saint Mihiel in France finally turned the tide in favor of the Allies. Air power played a tremendous role in this offensive. Brig Gen Billy Mitchell commanded nearly 1,500 Allied airplanes—American, French, British, Italian, and Portuguese—to drive the Germans out of France. This was the largest assembly of aircraft ever gathered for a single mission.

The Allied pilots had two goals. The first was to destroy German planes in the air. The second was to destroy German aircraft in hangars on the ground. Mitchell committed 1,000 planes to this portion of the mission. The rest of the planes protected the Allied ground troops. They scouted out enemy positions. Mitchell wrote that the Allied planes were “to be put into a central mass and hurled at the enemy’s aviation, no matter where he might be found, until complete ascendancy had been obtained over him in the air.”

The four-day Battle of Saint Mihiel established the role of mass movements of air power during wartime. It weakened the Central Powers and destroyed enemy supply lines. This offensive helped lead to Allied victory two months later.

## How the Airplane Revolutionized War

When World War I began in 1914, pilots flew everything from balloons and dirigibles to airplanes. They soared over enemy positions to spot troop movements and artillery positions. They also took photos of what they’d seen.

Each side wanted to do something to counteract this use of aircraft. Both sent up airplanes to shoot down observation aircraft, first with pistols and rifles and later with machine guns, as you read in the previous section.

Whether the enemy was using pistols or machine guns, another countermeasure was now necessary. Each side had to protect its observation aircraft. Aerial combat was born.

Furthermore, once machine guns were mounted on planes, pilots could use them to strafe soldiers on the ground. To **strafe** is to attack with a machine gun from a low-flying aircraft. Planes also delivered bombs behind enemy lines. At first pilots carried small bombs in their laps and dropped them by hand. Once aircraft could carry heavier loads, some ferried thousands of pounds of bombs. Accuracy of bombing, however, remained an issue.



A PILOT USES A GRAFLEX CAMERA

A pilot takes pictures of enemy troop positions circa 1917–1918.

Courtesy of Corbis Images



A GERMAN PILOT

A German pilot drops a bomb on an Allied position.

Courtesy of Corbis Images

Airplanes now offered possibilities that challenged age-old warfare strategies. In traditional battles, troops dug trenches. They tried to hold their own lines and break through the enemy's trench lines. Assaults were from the front. But airplanes changed that. Planes could fly over an enemy's trenches, bomb from overhead, and strafe troops. What's more, they could hit important targets behind enemy lines, such as factories. This provided the element of surprise as well.

Planes didn't come into their own until World War II. Nevertheless, their use during World War I set the stage for the next worldwide conflict.

## How Air Power Expanded During World War I

Airplanes flew a whopping 64 mph when the first shots of the Great War rang out. Most European nations had a few hundred planes. America had only about 20. But no one had aircraft that were combat worthy.

Over the next four years, the technology of the Allied and Central Powers' air power would continually leapfrog one over the other. Speeds picked up. Aircraft became stronger and sturdier. Maximum altitudes climbed from 10,000 feet to 24,000 feet.

As the saying goes, "Necessity is the mother of invention." And if survival in war isn't a necessity, what is?

## New Developments in Aviation During World War I

When Louis Blériot crossed the English Channel in 1909, some thought his quick, 37-minute passage from one country to another suggested the face of future wars. If a friendly aircraft could travel that fast from Calais to Dover, couldn't an enemy do the same? Many countries built small armies of planes. Once war broke out, the pace of invention picked up.

By 1918 three specialized types of aircraft had emerged: the fighter, the observation aircraft, and the bomber. Observation aircraft were in use from the start. Most of them were dirigibles and balloons. Some planes even had extra seats for photographers.

The fighter came into its own with the birth of the dogfight. This era had the biggest impact on small-craft development. Once both the Allies and the Central Powers had mounted machine guns with interrupting gear on their airplanes, quick, easy maneuvers became essential. A pilot wanted to get out of the way of the bullet spray.



### A BRITISH SOPWITH TRIPLANE

A British *Sopwith Triplane* was one of the aircraft designed during the war to engage in dogfights.

Courtesy of the EAA/Jim Koepnick

These fighter aircraft needed three qualities: they had to be lightweight, fast, and maneuverable. Both sides designed their own memorable fighters. The British built the Sopwith Camel and the SE-5A. The French had the Spad VII and Nieuport 28. The Germans crafted the Fokker Dr-I and D-VII.

Seven months before the war ended, a German designer named Hugo Junkers made a breakthrough. He built an all-metal, low-wing monoplane fighter, the Junkers D1. No longer would a pilot have to fly a plywood-and-fabric contraption that easily caught fire. Fortunately for the Allies, the Germans assembled only 45 of these planes.

During the war, airplanes became faster. By early 1918 fighters zipped along at a cool 130 mph. When Igor Sikorsky flew his four-engine, 92-foot-wingspan *Le Grand* in 1913, he probably couldn't have imagined that in just five years 100-foot-wingspan bombers would be carrying loads that weighed thousands of pounds. As the Germans learned with their zeppelins, bombs were best delivered by planes sturdy and large enough to carry heavy loads. The British, for example, designed the Super-Handley Page bomber. The first model had two engines; later models had four. The four-engine model could carry six men and 30 260-pound bombs.

Any breakthrough in design gave the side that had it an edge. Ground soldiers, pilots, commanders, and engineers—all contributed to the war effort.

## Why War Sped Up Aviation Development in the United States

When Congress appropriated \$64 million for airplanes in 1917, the United States was far behind other nations in air power. Curtiss Aircraft was the only aviation manufacturer in the country. Army staff officers still had their eyes focused on the infantry. They had no plans for their aviation section. The United States could never again be so unprepared.

Brig Gen Billy Mitchell believed strongly in the future of aviation as an instrument in warfare. He saw its possibilities, including as a weapon against navies. Mitchell didn't learn to fly until he was 36—that's old for a beginning pilot. But he was one of the freshest thinkers in air warfare.

After consulting with other officers, Mitchell devised a three-pronged theory to fight wars from the sky:

1. Air superiority over the battlefield must be completely assured.
2. Air power may then be employed offensively against the enemy's ground troops.
3. Finally, aerial bombardment may be directed against the enemy's supplies, railroads, communications, and airdromes.

As chief of the Air Service, Mitchell held great sway with Airmen. But the aviation arm still fell under the command of the Army. And the Army saw airplanes as nothing more than extensions of ground forces. Mitchell, on the other hand, always pushed for an independent air service. He considered new strategies, such as the mass use of airplanes in the Battle of Saint Mihiel. For these reasons, today's US Air Force still considers Mitchell one of its founding fathers. You'll read more about him in a later lesson.



**BRIG GEN BILLY MITCHELL**

Chief of the Air Service Brig Gen Billy Mitchell drew up the plan for the 1,500-plane movement in the Battle of Saint Mihiel.

Courtesy of the Wisconsin Aviation Hall of Fame

**CHECKPOINTS**

## Lesson 3 Review

Using complete sentences, answer the following questions on a sheet of paper.

1. How many planes did an Allied pilot have to shoot down to earn the “ace” title? How many did a German pilot have to down?
2. What type of soldiers made up the French Foreign Legion?
3. What two important things did American ace of aces Edward Rickenbacker do for his men?
4. Who was the only African-American pilot during World War I? Which air service accepted him?
5. Did Americans ever fly their own planes during the Great War? Whose planes did they fly?
6. What motto regarding air power emerged by war’s end?
7. What two good ideas concerning combat aircraft did the Germans borrow from the Allies?
8. What was the average airplane speed in 1914, and what was the average speed by 1918?
9. What three specialized types of aircraft had emerged by the end of World War I?

### Applying Your Learning

10. Explain how the airplane revolutionized war.