Reconstructive History:
Airplanes of World War II
By Mr. Cegielski

Lesson Objectives:
1. Know how air power evolved during WWII
2. Know the role air power played in WWII and its significance
3. Know the significance of the Allied air campaigns
4. Build scale-model, flying replicas of these aircrafts!

Review

A. What were the main combatant nations in WWII?
   - (1) Allies – Britain, France, U.S., Soviet Union, and China
   - (2) Axis – Germany, Italy, Japan

B. What were the differences in how air power was used in WWI and WWII?
   - (1) WWI – Observation
   - (2) WWII – Strategic bombing

C. What were some of the key events leading to war?
   - (1) Japan invades China
   - (2) Germany invades Poland then Soviet Union
   - (3) Japan attacks Pearl Harbor

How was air power developed during World War II?

A. By the late 1930’s, air power had become more reliable, and military leaders began to think ever more seriously about its prospects.
   - (1) Visionaries knew aircraft would some day serve in more than a supporting role
   - (2) With World War II, that day arrived. Both the Allies and the Axis Powers soon developed new strategies for waging war in the air.

B. The development of bombers, fighters, and transports
   - (1) Between the end of World War I and the start of the second world war, both the United States and Britain cut defense spending drastically.
   - (2) The Axis Powers were doing just the opposite. So when Germany invaded Poland in 1939, the Axis nations were well prepared for war. The Allies were not.
   - (3) At the time of the Pearl Harbor attack, the United States had 2,900 aircraft. Many weren’t fit for combat duty.
   - (4) In 1942 US manufacturers could build no more than 2,100 aircraft per year. By 1948 they increased that to 570 a month. And by 1941 they could build 1,900 airplanes a month.
   - (5) Requests from Britain and France, as well as the US military, spurred the factories to ramp up production.
   - (6) Pilots flew three key kinds of aircraft in World War II: the bomber, the fighter, and the transport.

WWII Bombers

- (1) America had the long-range B-17 Flying Fortress bomber as early as 1935. This, along with the B-24, saw a lot of action in Europe.
2) The B-24 Liberator was developed by 1938 and was in production by 1941. It had a 2,850-mile range and could fly 303 miles per hour (mph). Some 18,000 were built during the war.

3) The B-29 Superfortress was the long-range bomber of the Pacific theater. It was bigger than the B-17 and the B-24. It could also fly greater distances—5,830 miles, with a top speed of 365 mph. It was designed for bombing runs over Japan.

(4) Medium-range bombers included the B-25 Mitchell (1938) and the B-26 Marauder (1939). Both were in mass-production by February 1941.

(a) Lt Col Jimmy Doolittle used the B-25 in the 1942 Tokyo raid. This attack showed Japan that Allied planes could reach the home islands. The B-25 had a range of 1,200 miles and flew 275 mph.

(b) The B-26 Marauder flew mostly in England and the Mediterranean. It could fly 1,100 miles at a top speed of 285 mph. This bomber claimed the distinction of having the fewest of its numbers shot down of any Allied aircraft.

(1) Among the American fighters that saw action in World War II were the Lockheed P-38 Lightning, Bell P-39 Airacobra, Curtiss P-40 Warhawk, and Republic P-47 Thunderbolt.
2) Perhaps the most famous fighter was the North American P-51 Mustang. Both the P-51 Mustang and the P-38 Lightning escorted long-range bombers. These fighters protected the bombers on missions deep into Germany. (4) The P-38 gained a reputation among the German Luftwaffe in North Africa. They called it the “fork-tailed devil.”

3) P-39 pilots went on many strafing runs. The P-40 was a tough, sturdy plane. It saw action from the very start, going up against Japanese fighters at Pearl Harbor. The ranges on these fighters reached from 650 miles (the P-39) to 1,100 miles (the P-38). The P-51 had a top speed of 437 mph while the P-40’s fastest pace was 362 mph.

4) The Navy, meanwhile, enjoyed success in the Pacific with the P-38, as well as with the carrier-launched Grumman F-4F Wildcat, the Grumman F-6F Hellcat, and the Chance-Vought F-4U Corsair.

5) Developing any new aircraft was costly. The P-38, for instance, cost $652,000 to design. It would be considerably more in today’s dollars. Unlike other countries at the time, the United States held design competitions for its military aircraft. The Army Air Forces believed this resulted in better aircraft. The designers came up with unique features that furthered advances in air combat capabilities.
6) Other fighters of note included the British Supermarine Spitfire (range 395 miles; maximum speed 355 mph), the Hawker Hurricane (700 miles; 325 mph), and the twin-engine De Havilland Mosquito (1,400 miles; 378 mph).

7) Germany’s main fighters were the famed Messerschmitt 109 (405 miles; 292 mph), the Messerschmitt 110 (1,305 miles; 342 mph), and the Focke-Wulf 190 (560 miles; 408 mph).

    Germany also launched the world’s first operational jet fighters at the end of the war, the Messerschmitt 262 Schwaeble (650 miles; 540 mph) and the Heinkel 162 Volksjaeger (606 miles; 562 mph). Fortunately for the Allies, these jets appeared too late in the war to affect the outcome.

8) Japan’s premier fighter was the Mitsubishi Zero (1,930 miles; 331.5 mph), which completely dominated its American counterparts at the beginning of the war.

Transports

    (1) Transports were built to move people and cargo. They were less comfortable than commercial aircraft.
    (2) As applied to all branches of the military, a transport is a vehicle—aircraft, ship, or other—that carries people, supplies, tanks, and artillery.
    (3) The best-known air transport was the C-47 Skytrain. It was based on the Douglas Aircraft DC-3. It could fly 1,513 miles. It could reach 232 mph but generally cruised around 175 mph.
    (4) Besides ferrying ground troops and equipment, it moved paratroopers and towed gliders. Some 9,348 C-47’s were built by the end of the war.
The Allies’ strategy:

1. Overall plan:
   - (a) Protect Allied supply routes between the United States and Britain to stop the Germans from blowing up Allied ships carrying material—the equipment and supplies of a military force.
   - (b) Bomb the German war industry (factories and warehouses).
   - (c) Destroy German roads, bridges, and communication lines.
   - (d) Allied plan had one big hitch. Until 1944 most bombers flew without fighter escorts. The fighters weren’t equipped to make the long flight to Germany.
   - (e) Allies suffered huge losses, especially in 1943 over Germany. Not until March 1944 would bombers reach Berlin.
   - (f) Fighters eventually accompanied the bombers. In the meantime, the Allies also focused on German positions in France from 1942 to 1943. The hop across the English Channel was just more than 20 miles.

Growing German Aggression

- (1) Germany resumed hostilities in Europe in 1938 to take lands it felt belonged to it:
  - Austria, Czechoslovakia, and later, Poland. Most of Europe caved quickly before German aggression.
  - Britain was an exception. This small island nation was about all that stood between Germany and total conquest.

U.S.-British Relations

Before the United States joined Britain in its campaign to free Europe, the military and civilian leaders of the two countries met many times. They talked strategy:

- (1) The United States was already supplying Britain with ships, planes, and parts.
- (2) The Allies considered the chance Japan would one day attack the United States. They asked themselves how this would affect the Allied strategy.
- (3) The United States and England came to some important conclusions. They decided that even if Japan struck the United States, the first objective of the Allies would still be to defeat Germany.
- (4) Germany was in Britain’s backyard. Its factories churned out excellent planes and tanks. It had been hammering Britain for two years.
- (5) As of 1941 the combined forces of the US and England would have been hard pressed to fight all-out war on two fronts.
- (6) But by 1944 that was no longer true. Helped by the Soviets’ battle with the Germans on the Eastern Front, they could take on Germany and Japan full force.

Once the United States entered the war, air power had a big part in the European and Pacific theaters. It played both its old support role and its new offensive role of strategic bombing. Significant Allied air campaigns in the European theater—all Allied air actions in Europe had a single goal: to shut down the German offensive. The first great clash was the Battle of Britain.
The Battle of Britain

- The Battle of Britain was one of the most important of the war. This was a defensive battle for the British. The British were the first to stop the Nazi war machine.
- The battle began in August 1940. The Germans did small-scale raids to test British strength.
- England relied on its fighters for defense. Both British resolve and poor German planning helped Britain hold out.
- The Germans had only short- and medium-range bombers. They needed long-range bombers to hit Britain effectively.
- Germany made another big mistake. It didn’t count on British radar. Radar let the British spot German squadrons heading toward them across the English Channel.

The Battle of Britain continued...

- Because of radar, the RAF didn’t have to waste fuel patrolling in the air. And it didn’t have to waste manpower or put unnecessary wear and tear on its planes.
- Having radar was a bit like being able to see into the future. It allowed the RAF to send its fighter pilots where and when they were needed.
- Even so, German bombers did manage to get through to bomb London and the surrounding areas. They inflicted serious death and damage.
- But German efforts grew weak by 1941. The Luftwaffe had lost too many planes and crews to British fighters. British air power had saved Britain.

D-Day

- The Western Allies delivered a backbreaking blow to Germany in 1944. They called it Operation Overlord.
- The purpose of this invasion, which would take place on “D-Day,” was to retake Western Europe once and for all.
- The D-Day invasion began on 6 June 1944 at Normandy, on the northern coast of France. But preparations had begun much earlier.
- For two months, bombers and fighters of the Army Air Forces and RAF had been striking at German positions in and around Normandy. They wanted to soften the German defenses.
- They hit airfields, railroads, and coastal barriers. They downed Luftwaffe planes. They wiped out as much as they could within a 130-mile radius of the Normandy beaches where American, British, and Canadian Soldiers would land.
- The night before the invasion, the Allies hit German forces extra hard. Hundreds of bombers, which normally flew at an altitude of 20,000 feet, raced through the air just 100 feet to 1,000 feet above ground. After dropping their bombs, the aircraft strafed targets on the ground.
- On D-Day, fighters played a critical role. They, too, conducted bombing missions. The P-38 Lightning could carry two 1,000-pound bombs. One group of fighters flattened a German command center.
- In addition, fighters destroyed German infantry. They protected ships crossing the English Channel en route to the Normandy shoreline. They were also used to escort, or accompany, bombers and air transports.
- The first wave of transports that crossed the channel on D-Day was breathtaking. It was nine aircraft wide in a line extending for 230 miles.
- Many of the Soldiers arriving on the beach by air transport were paratroopers. A paratrooper is an Infantry Soldier who is trained to parachute, often behind enemy lines.
- Transports also towed gliders carrying men and materiel. Most of these gliders were made of wood and fabric, just as the earliest planes were. On the evening of 6 June one glider took off from England for France every 15 seconds.
- The D-Day invasion and the Battle of Normandy cost 57,000 Allied Soldiers and Airmen their lives.
- It was a major turning point in the war. It gave the Allies a foothold in Europe.
- More than 1 million men landed along 60 miles of beaches within seven weeks of D-Day. But there was still more to be done to achieve final victory in Europe.
The Final Push

1. Despite these gains, the Allies had not yet won the war in Europe. From the beaches in Normandy, the Western Allies pushed through the rest of France, Belgium, and Luxembourg.

2. Meanwhile, on the Eastern Front, the Soviets pushed the Germans out of the Soviet Union and through Eastern Europe. In September the first US patrols entered Germany.

3. At the end of December 1944, the Germans made a desperate surprise counterattack in Belgium. They wanted to divide the Allied armies and force a negotiated peace.

4. The epic battle in the Ardennes Forest is known as the Battle of the Bulge. Allied air power provided crucial help to the brave ground troops in beating back this attack.

5. Luftwaffe planes attempted to support German forces by attacking US troops on the ground. But in most cases Allied fighters stopped them short of their targets.

6. Although poor weather limited flying on several days, Allied bombers seriously hampered German efforts. They bombarded roads, railroads, and bridges behind the lines. This made it more difficult for the Germans to move up supplies and troops.

7. German defeat in the Battle of the Bulge not only sealed the Nazis’ fate on the ground, it also destroyed German air power. The commander of the Luftwaffe fighter arm, Lt Gen Adolf Galland, wrote, “The Luftwaffe received its death blow at the Ardennes offensive.”

8. The strategic bombing of Germany went on. The Allied bombers and escorts hit airplane factories, oil refineries, and roads.

9. By 1945 most bombing runs over Germany involved between 1,000 to 1,500 bombers. The Eighth and Fifteenth Air Forces conducted these missions.

10. The Army Air Forces and RAF ran out of targets by 15 April 1945. They had unloaded 2.5 million tons of bombs on the Axis Powers in Europe.

11. The United States and Britain lost 8,000 bombers and 17,000 fighters, but the Luftwaffe, despite its initial advantage, lost 33,000 airplanes.

12. On 7 May 1945 the Germans surrendered. The European chapter of the war was closed.

13. The nuclear arms race, jet airplanes, and humanity’s first steps in space all happened because of developments during the war.

14. The war also ended in a new rivalry between the Western democracies and the Soviet Union.

15. At the same time, however, the US economy and the recovering economies of Europe would grow rapidly after the war. And advances in commercial aviation were at the forefront of that growth.

World War II: Model Airplane Project!

PURPOSE: To provide a crosscurricular approach by fusing history, mathematics and physics to create a successful flight of a model airplane!

DIRECTIONS: In this project, you will work in a small group to build a rubber-band powered airplane, based on a real WWII combat plane! Here are the requirements:

1. You must bring your own building materials, including: glue, balsa wood, light canopy paper, exactor knives, propeller, rubber bands, wheels, etc. If this is a problem for your group, let me know. 20 points

2. You must follow the blueprints of the model. I have several to choose from; if you find your own, please let me know. 20 points

3. Your model should be scaled correctly and feature the correct proportions. You must also design this to be a sturdy, but light aircraft so that you do not have a crash landing! 20 points

4. You must color or paint your model to reflect how the aircraft actually looked. Include appropriate decals. Research to discover how your plane looked. 20 points

5. Your plane should fly! The rubber band inside the plane should spin the propeller and allow the plane to accelerate through the air! For safety reasons, please consult me about using gas-powered engines. 20 points

ALTERNATIVES? Alternatives will be considered under special circumstances; however, I would rather not have you go to Hobby Lobby and buy a premade model kit.

DISCLAIMER: I will monitor the students very carefully in class as they build their models; however, I cannot be held responsible for potential accidents. Tools, especially the exactor knives, must remain in your area at all times in my classroom. STUDENTS ARE NOT PERMITTED TO CARRY TOOLS WITH THEM ON SCHOOL GROUNDS! Please sign below, indicating that you are giving your approval for this project:

Parents Signature: ___________________________ Date: ____________

Student Signature: ___________________________
Schmitt 110 model plans

Schmitt 110 finished model

For more plans and instructions, visit my website at www.historyscholars.weebly.com.