

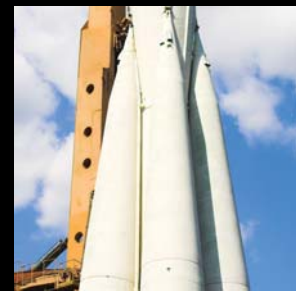


A Pittsburgh CLO
 Gallery of Heroes Musical
 Presented in partnership with the
 Senator John Heinz History Center



PIONEERS OF FLIGHT

Book, Music and Lyrics by Jason Coll



TEACHER'S GUIDE

MAJOR SUPPORT FOR THE GALLERY OF HEROES IS PROVIDED BY:
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SENATOR JOHN HEINZ

HISTORY CENTER

IN ASSOCIATION WITH THE SMITHSONIAN INSTITUTION



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Through dramatic sketches and musical vignettes, Pittsburgh CLO's Gallery of Heroes program takes its 50-minute mini-musicals to area schools to educate and enlighten students about great historical figures such as Roberto Clemente, the Wright Brothers and Harriet Tubman. Highlighting the lives and accomplishments of significant historical figures, the Gallery of Heroes program offers an entertaining alternative to traditional lectures and books.

PITTSBURGH CLO EDUCATION PROGRAMS

Pittsburgh CLO Academy - Creative Vision - Gallery of Heroes
 The Gene Kelly Awards - Mini Stars - Internships - New Horizons

Information About Musicals

The Writers: Most musicals are broken into three parts: the Book, the Lyrics and the Music. These are usually divided among three people who work together in a collaboration. The **Playwright** writes the script or the lines that the actors speak. This is referred to as the **Book**. The **Lyricist** writes the words the actors sing, and the **Composer** writes the music for the show. Each writer works independently, then together they share ideas and revise the show until they decide it is ready to be produced. In *Pioneers of Flight*, all three parts: Book, Lyrics and Music, were written by one person.

The Artistic Staff: The **Director** oversees all aspects of the production and has many responsibilities including making sure the show has a successful run from start to finish. The Director hires the **Choreographer** and the **Music Director**. The Director also meets with the **Costume** and **Scenic Designers** to make sure that their designs match the writers' vision.

The **Stage Manager** assists the Director. The Stage Manager schedules the meetings between the Designers and Director and obtains any materials or props that may be needed for the show.

The **Choreographer** creates and teaches all of the dancing or stylized movement for the show. The **Music Director** works with the orchestra and teaches all of the music to the performers.

The Performers: All actors need to audition to perform in a musical. During auditions, each performer must sing and dance for the Director, Choreographer and Music Director. If the artistic staff thinks an actor may be right for the show, he is invited to a callback. A callback is a second audition in which the actors are asked to sing, read from the script and dance a movement combination taught by the Choreographer. The results determine who is chosen to perform in the show.

The Rehearsals: Rehearsals are intense practices where the actors learn their lines, songs and blocking – movement on the stage – for the show. During rehearsals, the stage crew works backstage to move scenery and help the actors with costume changes.

The final practice for the show is called the **Dress Rehearsal**. Here the actors, artistic staff, stage crew and designers showcase the finished product. The Dress Rehearsal is usually the first and only time they get to run the completed show on stage without an audience. After the dress rehearsal – it's opening night!

As you can see, there is a lot of work that goes into making a musical. We hope that this brief overview has helped you appreciate the many talents that contribute to creating and mounting a show.

Turn to
Pages 7-8 for
Classroom
Activities that
will lend
a hand in
fulfilling your
PA Academic
Standards.

About this Musical

GOALS

- To realize the importance of accepting, overcoming and creating challenges in order to achieve any goal(s)
- To recognize the sacrifices and triumphs made by various pioneers of aviation
- To understand the history of flight
- To appreciate musical theater

STUDENT OBJECTIVES

- Study the history of aviation and its early pioneers
- Compare the lives and experiences of the aviators to their own lives and experiences
- Demonstrate how flight has influenced society
- Perform basic experiments that explain the fundamentals of flight
- Discuss the need for challenges for advancement in any area of life

Theater Etiquette

The audience is an important part of every performance, whether it is a symphony, a play or a musical. During live theater, the performers and audience members react with each other in a way that is not possible when seeing a movie or watching television. Your actions affect the success of the theater production.

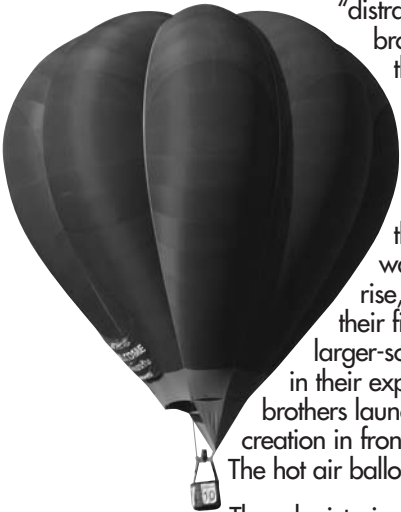
Pioneers of Flight

Introduction

For hundreds of years, mankind has reached for the clouds. Some have strapped on wings and leapt from buildings, bridges and bluffs in misguided attempts at bird-like flight. Unfortunately, oversized wings flapping furiously against gravity was not the solution to man's flying aspirations. How could humans soar over tree tops? How could they fly "Above the Clouds?"

The Montgolfier Brothers – Up, Up and Away!

In June of 1783, two French brothers stood on the ground below as their aeronautical creation climbed into the sky overhead. Jacques Etienne and Joseph Michel Montgolfier were born into a family of paper makers. Eventually, the brothers became the directors of the family's paper factory in France. Although the business was in their blood, the Montgolfiers were easily distracted by other ventures. One of these "distractions" turned out to be the brothers' destined contribution to the world – ballooning.



The Montgolfiers discovered that paper bags filled with smoke floated. Through further experimentation and analysis, they drew the conclusion that it wasn't smoke causing the bags to rise, but the hot air. Inspired by their findings, they went to work on a larger-scale creation – a balloon – to use in their experiments. On June 4, 1793, the brothers launched their cloth and paper creation in front of a crowd in Annonay, France. The hot air balloon was a success!

Though victorious and celebrated, the Montgolfiers thought beyond the simple invention of the balloon. They wanted to make it possible for a person to ride in the balloon, to experience flight. However, the brothers had trouble convincing someone to be the first passenger. Eighteenth century science didn't have the answers to people's questions. Could humans breathe high above the Earth's surface? Would the balloon simply float away into space? Was it possible to return alive? The atmosphere was an unexplored frontier in 1793, and the Montgolfiers would have to find non-human passengers to test the safety of their invention.

While the first hot air balloon passengers were not, literally, guinea pigs, they were members of the animal kingdom. The Montgolfiers sent a duck, a sheep and a rooster into the air and brought them back alive. The farm animals' trip proved that the air above the Earth's surface contained enough breathable oxygen to make air travel safe, ushering in a new era of passenger flight.

The Wright Brothers – Everything they touched turned to gold

Balloons are fine for a leisurely trip over town or for a thrill ride at the state fair, but passengers longed for more. They wanted something faster that could take them higher for longer periods of time. A hundred years after the Montgolfier brothers puffed smoke into a paper bag, two different brothers from mid-western America answered society's call.

It all began with a toy Mr. Wright brought home to his young sons in 1878. Eleven year old Wilbur and seven year old Orville were mesmerized by the paper and wood toy that flew straight into the air when its rubber band "engine" was twisted. While the toy sparked the boys' interest in flight, they gathered the determination, perseverance and work ethic necessary to attain their goals from their life experiences.

Wilbur and Orville's parents encouraged their sons' creative endeavors. Their father, a minister who published his church's newspaper, taught the boys the importance of honesty and hard work, while their mother sparked the boys' curiosity in the inner workings of household objects. She allowed them to help her fix broken items around the house and perform experiments in her kitchen.

As young men, Wilbur and Orville explored different jobs and interests. Orville received a small printing press as a gift that inspired him to create a larger printing press. The brothers began publishing a local newspaper in their hometown of Dayton, Ohio, and, eventually, opened a successful printing shop. Soon, the brothers traded printing for pedaling. The bicycle business became the Wright Brothers' next endeavor.

Although they were not college-educated, the Wrights read books on a variety of subjects, teaching themselves what they might have learned at a University. It is through reading that the brothers became aware of aviation advancements. They read about a German man named Lilienthal who had built a butterfly-shaped glider.



Unfortunately, Lilienthal died testing his invention. The story inspired the Wright Brothers to think of ways to learn from his mistakes and make flight possible.

The brothers dove headfirst into the study of flight. They read everything they could find and

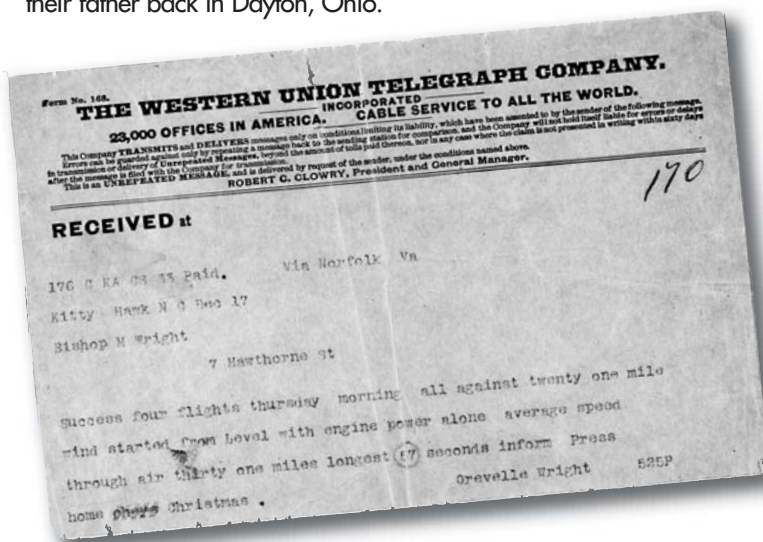
gathered information to help them build their flying machine. Studying watercraft, the Wrights decided that their machine would need a means of maintaining balance and control—something like a boat's rudder. Wilbur and Orville tested their

new idea by building a small model glider that was flown like a kite. When the glider passed the test, they built a larger version and took it to Kitty Hawk, North Carolina. They chose Kitty Hawk because of its high winds and sandy dunes that would break their fall if they crashed.

While at Kitty Hawk, they faced plenty of challenges while testing their invention. Since there were no hotels or restaurants, the brothers had to camp out on the windy, chilly beach and hunt wild game for food. The biggest challenge for Wilbur and Orville was overcoming their frustration in the possible failure of their invention. They persevered, returning to Dayton to make improvements and adjustments to the glider over the winter months.

For several years, the Wright Brothers created and tested different devices that would make their glider a success. They added a tail, propellers and a small motor. Society was not entirely supportive of the Wrights' ideas. People ridiculed Wilbur and Orville for thinking that air could hold up something as heavy as an engine-driven plane. Fortunately, they ignored the insults. Their patience and diligent efforts finally paid off on December 14, 1903.

Back on the beaches of Kitty Hawk, the brothers tossed a coin to determine the pilot of the plane. Wilbur won, but the plane didn't work. Undaunted, they mended the plane as they had so many times before, and tried again on December 17. This time, Orville manned the plane. He and Wilbur each completed several successful short flights. The fourth flight, made by Wilbur, lasted nearly a minute and spanned 852 feet. They telegraphed their father back in Dayton, Ohio.



"SUCCESS FOUR FLIGHTS THURSDAY MORNING ALL AGAINST TWENTY-ONE MILE WIND STARTED FROM LEVEL WITH ENGINE POWER ALONE AVERAGE SPEED THROUGH AIR THIRTY-ONE MILES LONGEST 57 SECONDS INFORM PRESS HOME CHRISTMAS."

ORVILLE WRIGHT

Bessie Coleman – Finding Freedom in the Skies



The Wright Brothers' invention opened up new opportunities for travel and commerce. It inspired people to take interest in the world of flight. A young, African American woman named Bessie Coleman took an interest and dared to set new challenges in the field of aviation. She proved that freedom could be found in the skies.

Bessie Coleman was born on January 26, 1893 to an African American mother and a Native American father in Texas. After teaching herself to read, Bessie fell in love with books. She was an excellent student at school while working several jobs to help her family financially. At nine years old, she became her younger sisters' primary caregiver while her parents worked. She loved school, but her responsibilities at home prevented her from attending regularly. Picking cotton during the harvest season, Bessie knew she wanted a better life. As soon as her sisters were older, she went back to school. Her grades were excellent, but before she could attend college, she had to enroll in preparatory school.

Bessie moved to Chicago and worked as a manicurist and a chili parlor manager. She continued to read as many books as she could. After reading about flight and attending a local air show, Bessie decided that she wanted to become a pilot. She applied to every flight school in the United States, but every school rejected her because of her gender and race. Bessie didn't allow this challenge to end her flying dreams. Instead, she searched for a solution.

While working as a manicurist, Bessie befriended an African American publisher named Robert Abbott. With Abbott's advice and support, Bessie pursued her dream of becoming a pilot. There was a flight school in France that would not discriminate against her. In preparation for her trip to France, Bessie spent years taking French lessons and reading about France's history and culture. She saved money for her boat ticket while working at the chili parlor. Finally, Bessie went to France. In 1921, she was the first African American woman to be granted a pilot's license.

Bessie reached her goal, and she wanted to help others reach their goals. Knowing how difficult it was to earn her license, Bessie decided to start saving money to open a flight school that would train everyone. She hoped that her school would give women and minorities the same education in the United States that she had to travel across the ocean to receive. Bessie performed in air shows across the country to raise money for her flight school. Courageously, she flew figure eights over captivated audiences. In May of 1926, one of Bessie's stunts went horribly wrong when her plane crashed, killing her.

Bessie's flight school dream did not die with her. A publisher named William J. Powell admired her achievements and wanted to ensure that her flight school dreams became a reality. Powell agreed with Bessie's belief that African Americans could find new career opportunities if they learned aviation skills. He suspected that air transportation would soon surpass railroad transportation,

and he knew that African Americans could elevate their economic and social status if they learned about this new industry. In 1929, Powell finished what Bessie started when he opened the Bessie Coleman Aero Club in Los Angeles.

What is the phrase found on North Carolina's car license plates?

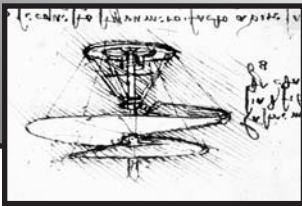
FIRST IN FLIGHT

What was the name of the laws that separated black and whites in public places during Bessie Coleman's time?

THE JIM CROW LAWS

What Renaissance artist drew pictures of flying machines hundreds of years before the Wright Brothers invented the airplane?

LEONARDO DAVINCI



Charles Lindbergh – “Lucky Lindy”

One year after Bessie Coleman died doing the thing she loved, Charles Lindbergh made aviation history. If Bessie bridged the gap between black and white, then Charles connected east and west.

Charles Lindbergh grew up in the great outdoors of Little Falls, Minnesota. His father encouraged his son to be self-sufficient, leading Lindbergh to adopt a philosophy of independence that resulted in his nickname – the “Lone Eagle.” The self-confidence he learned from his father helped him disregard the failures of other aviators and strive to achieve what no one else had.

As a teenager, Charles yearned to fly planes in the Army Air Force but found other ways to help the Army until he was old enough to join. At sixteen, Charles became a farmer and raised crops for the Army. His two year stint as a farmer improved his work ethic and taught him about mechanical equipment. In 1920, Charles attended the University of Wisconsin. After a year and a half, he left college to pursue his dream of flying. His parents were concerned – most pilots flew less than 900 hours before being killed.



In 1919, Frenchman Raymond Orteig offered \$25,000 to the first person to fly nonstop from New York to Paris. Many courageous pilots attempted the flight, eager to claim the money and the glory, but none succeeded. Several pilots lost their lives chasing the prize. Like the Sword in the Stone, the Orteig Prize was waiting to be claimed by the worthiest of men. In this case, it was waiting for Charles Lindbergh to grow up and become a pilot. In 1927, a 24 year old Lindbergh won the contest. His 33 1/2 hour flight changed the course of history, proving that trans-Atlantic flight was possible.

Around the world, Lindbergh became an instant hero. Everyone wanted a piece of him. He was honored by dignitaries at home and abroad. He received fan mail every day. Lindbergh had achieved something so difficult and made it look so effortless, but he had to overcome numerous challenges to reach his goal. When he decided to attempt the flight from New York to Paris, he was working as a postal pilot delivering mail. He needed investors. At first, the investors he approached thought it was foolish to support a young mail carrier in a competition even the most experienced pilots were unable to win. Charles persisted. Finally, the investors agreed to pay for the \$13,000 Ryan monoplane. In turn, Charles agreed to name the plane “The Spirit of St. Louis” in honor of their city.

Lindbergh's next challenges tested his physical and mental strengths. Learning from the mistakes of previous pilots, he determined that their planes were too heavy to make the journey across the ocean. As a result, Charles decided to fly alone without a team. He worked to ensure that his plane was as light as it could possibly be, even trimming off the edges around his map to save weight. Another flying challenge for Lindbergh was the design of his plane. Charles had to use a periscope to navigate; this meant he had only a tiny hole to see out of instead of a regular windshield. He also had to fight off sleep for 33 hours. Dosing off for a second could mean death. He was alone with no one to help him if something went wrong. But, the “Lone Eagle” made it across the Atlantic and earned a new nickname – “Lucky Lindy.”

After his heroic flight, Lindy became a goodwill ambassador for the United States, traveling around the world. During a visit to Mexico in 1927, he met his future wife, Anne Spencer Morrow, the daughter of the U.S. Ambassador to Mexico. The “Lone Eagle” found a companion. He taught Anne how to fly, and they flew around the world together, serving as goodwill ambassadors and charting courses for airlines. She became the best navigator he could ever have.

What were Lindbergh's first words when he landed in Paris?

“IS THERE A MECHANIC HERE?”

What did Amelia Earhart bring to drink on her flights?

TOMATO JUICE

Amelia Earhart – “The Girl in Brown Who Walks Alone”

Tall, slender, brilliant and brave just like a certain famous male pilot, Amelia Earhart did not appreciate the public calling her “Lady Lindy.” Amelia didn’t have the best track record with nicknames. In high school, her peers referred to her as “The Girl in Brown Who Walks Alone” because she had a difficult time fitting in with the other “lady-like” girls. As a child, Amelia was classified as a tomboy who enjoyed playing sports more than playing with dolls. She loved playing make-believe games and building new inventions with her younger sister Muriel. One summer, they made a roller coaster out of roller skates, old boards and fence rails. Amelia fell in love with the feeling of flying across her backyard on the homemade ride. With so many exciting alternatives, Amelia found the idea of learning to sew and perfecting the “art of being a lady” boring in comparison. She was more interested in figuring out how things worked and how she could make them better.

While Amelia was in finishing school in Philadelphia, she went to visit Muriel at college in Toronto. While in Canada, she saw many soldiers wounded in World War I. Amelia, who had been sheltered from the true effects of war, now faced the grim reality. According to Amelia, “For the first time, I realized what the World War meant. Instead of new uniforms and brass bands, I saw only the results of four years’ desperate struggle; men without arms and legs, men who were paralyzed, and men who were blind.” She told her mother that she was dropping out of finishing school in order to stay and work as a nurses’ aide in Toronto. Amelia argued that she had nothing in common with the pompous girls at Ogontz School. She wasn’t concerned about fashion or parties. She wanted to be where she could be of service to those in need. Amelia worked twelve hour days scrubbing floors and taking care of wounded soldiers. During her free time, she watched airplanes take off from a nearby field.

After World War I ended, Amelia went on to Columbia University and studied science in order to someday achieve a medical degree. Visiting her parents in California, Amelia took a flying lesson and her interest in flight returned. Medicine was replaced by Amelia’s new interest. She worked several jobs in order to pay for a second-hand airplane. From the moment she first sat in the cockpit, she proved to be unstoppable in the quest for flying firsts. She was the first woman to fly (as a passenger) across the Atlantic Ocean on June 17, 1928. Amelia was the first woman to fly solo across the Atlantic; in fact, “Lady Lindy” beat “Lucky Lindy’s” flight time and set a new trans-Atlantic record of 13 hours, 30 minutes. She became the first woman to fly from Hawaii to Oakland, California. And lastly, she was the first woman to attempt to fly around the world.



In a letter to her husband, George Putnam, Amelia wrote about her around-the-world flight, “I’m aware of the hazards... I want to do it. Women must try to do things as men have tried. When they fail, their failures must be but a challenge to others.” A successful publisher, George gave Amelia the freedom that she needed. Amelia warned George before they were married that she wouldn’t be a good wife. She wouldn’t stay at home cooking and cleaning, and she wasn’t interested in being the pretty wife on his arm at parties. George and Amelia had a free and loving relationship that allowed each of them to remain independent and pursue their interests.

On June 1, 1937, Amelia prepared to set off with her navigator, Fred Noonan, for her flight around the world. George was there to wish her well on her journey, as they said their goodbyes, he noticed that Amelia wasn’t wearing her lucky bracelet. The bracelet had been on her wrist for every successful flight. He insisted that he return home to get it for her, but she refused to wait. She had a wonderful navigator and was confident that nothing would go wrong.

On the last leg of her flight around the world, Amelia had to cross 2,556 miles of the Pacific Ocean. She planned to land on a tiny spot of land called Howland Island, a dangerously small target in the middle of such an enormous ocean. Unfortunately, Amelia and Fred missed the small island. Nobody knows for sure what happened to her plane. The June 1937 disappearance of Amelia Earhart and Fred Noonan prompted one of history’s largest search parties, but the plane and its occupants were never found.

Creating Their Own Challenges

What is a challenge? It’s something that makes a path more difficult to travel. It makes reaching goals harder, but not impossible. The ability to overcome challenges makes heroes out of average men and women. Everyone faces challenges. Some people confront challenges every day. Without challenges, society would remain stagnant without improvement or creativity.

All of the flight pioneers faced outside obstacles and challenges. The Montgolfier Brothers had to find “pilots” for their new aircraft; they had to determine if the air was safe above the earth’s surface. The Wright Brothers suffered through public doubt and numerous design setbacks. Charles Lindbergh needed to convince investors that funding a mailman’s flight expedition across the Atlantic was not a ridiculous idea. Amelia Earhart endured being an outsider during her formative years and worked against gender bias. Bessie Coleman overcame racial discrimination to soar higher than any African American woman before her. These pioneers of flight didn’t stop once they achieved their initial goals. They continued to challenge themselves with setting new records, opening flight schools, and proving that there is no limit to what man – and woman – can achieve. It would have been easy for them to sit back and enjoy past glories, but a true pioneer must always strive for something higher – something “Above the Clouds”.

Classroom Activities & Pennsylvania Academic Standards

Lesson 1: Discussion/Activities to be used *before* seeing the musical

- 1. Survey the class:** Who in the class has flown in an airplane? What was the plane like? Has anyone in the class flown to Europe? What forces in your body did you feel when the plane started down the runway? Do you feel this force during the entire flight? Why/why not? How many hours was your flight? Paris is approximately 3600 miles from New York and an average flight is about 8 hours. Calculate your average speed. From this discussion, enter into a discussion of what early planes looked like and how people flying in them might have felt. Show pictures of planes from the 1920s and modern times.
- 2. Construct a class timeline of each of the pioneers of flight.** Follow the order of the biographical sketches given in this booklet.
- 3. Review the biographies of each of the pioneers with the students.** Perhaps the students could do their own research on the pilots. Ask the class if they have family members or friends who are pilots. This could provide an interview activity.
- 4. Using a map, have the students locate where each aviator is from and/or where they became famous.**
- 5. Discuss the following key terms:** a.) pioneer b.) discrimination c.) goal d.) challenge e.) heroism f.) obstacle g.) perseverance h.) guinea pig (2 definitions) i.) ridicule j.) investor
- 6. Have the students complete the first two columns of a KWL Chart.** The **K**now column is for writing down everything already known by the student about aviation and early pioneers of aviation. The **W**ant to learn column is to be filled in with everything that the student wishes to learn about aviation and its early pioneers. The **L**earned column is to be filled in after watching the musical.

Flight in Western Pennsylvania

- Calbraith Perry Rodgers, a 32-year-old Pittsburgh man, was one of the Wright brothers' first students. In 1911 Rodgers flew his Wright Flyer (named the Vin Fiz for his grape soda sponsor) completing the first transcontinental flight across America. His 4,000-mile trip from Long Island to California took 84 days and involved 39 crash landings.
- When the Air Mail Act of 1925 turned airmail over from the government to private contractors, McKeesport native Clifford Ball was one of the first to receive a contract. His Pittsburgh to Cleveland run began in April 1927.
- The center of early aviation in Western Pennsylvania was Pittsburgh-McKeesport Airport later renamed Bettis Field after Army Air Corps pilot named Cyrus Bettis. It opened as a dirt runway in June of 1925. Local aviation needs soon outgrew Bettis, and, in 1931, the Allegheny County Airport opened one mile to the west.
- Local resident Kenneth W. Scholter contributed a collection of photographs and personal papers that focuses on the founding and growth of the aviation industry in Western Pennsylvania during the twentieth century.
- August Becker was the Manager of Bettis Field. In 1929, he bought the facility and broadened its scope to include aviation mechanics, renaming it Pittsburgh Institute of Aeronautics.

To find more local connections, log on to www.heinzhistorycenter.org or visit the Senator John Heinz History Center in the Strip District.

Lesson 1: Academic Standards

RWLS

- 1.2 Reading Critically in all Content Areas
- 1.6 Speaking and Listening
- 1.8 Research

Mathematics

- 2.1 Numbers, Number Systems and Number Relationships
- 2.2 Computation and Estimation

Science and Technology

- 3.4 Physical Science, Chemistry and Physics
- 3.6 Technology Education

Geography

- 7.1 Basic Geographic Literacy

History

- 8.1 Historical Analysis and Skill Development
- 8.2 Pennsylvania History
- 8.3 United States History

Career Education

- 13.1 Career Awareness and Preparation

Classroom Activities & Pennsylvania Academic Standards

Lesson 2: Discussion/Activities to be used *after* seeing the musical

- 1. Have the students think back to the discussion held before seeing the musical.** What new information was learned? What was most fascinating about the show? What character(s) did the students think was the most heroic? Why? Do they think they could have accomplished some of the feats that these early aviators accomplished? Would they have been able to overcome the many challenges that these aviators faced? How did the Wright brothers' background help them to overcome many of the challenges of designing an airplane?
- 2. In order to achieve their goals, early aviators needed strong determination.** List all the challenges that Bessie Coleman had to overcome to become a pilot. Is there anything that the students have achieved that required great determination? Students should decide on a goal that they want to reach. Have the students write a paragraph describing the challenges involved with reaching their goals and what they are going to do to overcome these challenges.
- 3. Have the students compare their observations of a helium balloon rising to the ceiling at their birthday party to a hot air balloon.** What principle do they both employ?
- 4. On a globe, with a piece of string held taut, place the ends of the string at the beginning and end of a flight from NYC to Paris.** It is the shortest distance between the two cities and is called the "great circle" route. Does the flight head directly east, as might be expected? Over what landmasses would the flight pass?
- 5. Have the students compare the average speed of their flight (calculated before the musical) to that of Charles Lindberg's 33 hour trip.** Challenge Question: The fourth flight of the Wright brothers was 850 feet long and lasted for 1 minute. Calculate their average speed.
- 6. Construct a model of an early airplane.**
- 7. Instruct the students to complete the last column of the KWL Chart.** Students will fill in everything that they learned from the musical concerning flight and the early pioneers of flight. Students can compare their charts when finished.
- 8. Quick-check writing assignments based on the musical.** These writing assignments can serve as quick-check guides for seeing how much the students comprehended and paid attention to the musical. They can also generate discussion. **List Writing:** Have students make a list of what they remember from the show. Depending on the age and ability of the students, these lists can be long, or as short as three items. **Sentence Writing:** Have the students write complete sentences based on the facts that they learned from the musical. Again, the number and the quality of the sentences will depend on the age and ability of the students. **Paragraph Writing:** Have the students write a complete paragraph describing what they learned from the musical. Proper paragraph format should be followed.
- 9. Hold two competitions where students will make paper airplanes which fly either the fastest or the farthest.** Compare and contrast the properties of each category's winning plane.
- 10. Have the students investigate how air affects the motion of an object.** Have the students drop a coffee filter (opening up) to the floor. Compare the speed and time of drop to that of a crumpled up filter. The air resistance is less in the crumpled filter because of less surface area. Which will fall faster, a penny or the crumpled filter? The students will be surprised to see that they fall at about the same rate.
- 11. Determine and portray the impact that flight has had on society.** Here are some suggestions: a) Students can design a poster showing the differences between life before and after the airplane. b) Groups of students can write and perform small skits showing how society has been changed by the advent of commercial air travel. c) Students can write newspaper articles that mirror what they think news articles might have stated at the time of the Wright brothers, Charles Lindbergh, etc.
- 12. Explore the Internet.** The web sites listed on the opposite page can give students and teachers more information about flight. Interactive, on-line exercises and experiments are available and can be used either before or after viewing the musical.

Classroom Activities & Pennsylvania Academic Standards

Lesson 2: Academic Standards

RWLS

- 1.1 Learning to Read Independently
- 1.2 Reading Critically in all Content Areas
- 1.6 Speaking and Listening

Mathematics

- 2.1 Numbers, Number Systems and Number Relationships
- 2.3 Measurement and Estimation
- 2.9 Geometry

Science and Technology

- 3.2 Inquiry and Design
- 3.4 Physical Science, Chemistry and Physics
- 3.5 Earth Sciences
- 3.6 Technology Education

Geography

- 7.1 Basic Geographic Literacy

History

- 8.1 Historical Analysis and Skill Development
- 8.3 United States History

Career Education

- 13.4 Entrepreneurship

Suggested Resources

Pittsburgh History Magazine

National Air and Space Museum Educational Programs

<http://www.nasm.si.edu/education/onlinelearning.cfm>

Museum of Aviation Education Department

<http://www.moaeducation.com/nasa.php>

Zenith Aircraft Company's Aviation Education Links and Resources

<http://zenithair.com/misc/school/aved-resource.html>





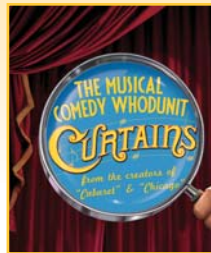
2010 Summer Season



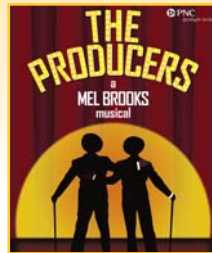
JUNE 1-6



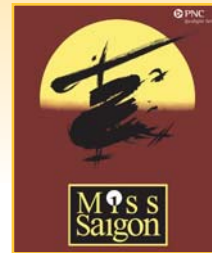
JUNE 8-20



JUNE 22-27



JULY 6-18



JULY 20 - AUGUST 1



AUGUST 3-8

PITTSBURGH CLO EDUCATION PROGRAMS

Pittsburgh CLO Academy - Creative Vision - Gallery of Heroes
The Gene Kelly Awards - Mini Stars - Internships - New Horizons

Pittsburgh CLO Academy of Musical Theater Just a few blocks from the bright lights of the Benedum Center, the sound of booming pianos bounces off the brightly painted walls of Pittsburgh CLO Academy of Musical Theater as children of all ages enthusiastically train for their moment in the spotlight. Providing the finest dance, music, and acting training, and affiliated with one of the most respected musical theater organizations in the country, the CLO Academy encourages both an appreciation for musical theater and a well-rounded education through professional quality courses.

Pittsburgh CLO Academy's Summer Camps Pittsburgh CLO Academy's one, two and three week summer performance camps are designed to present students with a professional environment that combines creativity with skill development and performance opportunity. Working with professional Directors, Music Directors and Choreographers, students will be involved with a musical theater experience that will last a lifetime!

Pittsburgh CLO Mini Stars, sponsored in part by the CLO Guild, is an ultra-talented troupe of young performers who showcase their high-energy Broadway song and dance extravaganzas throughout the Tri-State area. Their special brand of musical theater magic has excited hundreds of thousands in their 27-year history.

Through dramatic sketches and musical vignettes, **Pittsburgh CLO's Gallery of Heroes** program takes its 50-minute mini-musicals to area schools to educate and enlighten students about great historical figures such as Roberto Clemente, the Wright Brothers and Harriet Tubman. Highlighting the lives and accomplishments of significant historical figures, the Gallery of Heroes program offers an entertaining alternative to traditional lectures and books.

Pittsburgh CLO's Gene Kelly Awards presented in partnership with the University of Pittsburgh, is a Tony® Awards-style celebration of excellence in high school musical theater in Allegheny County. High School theater programs are the clear winners as show business veterans and community celebrities help spread the word about the achievements of area high schools and their musical theater programs. Originated in 1991, the Kelly Awards have become a Pittsburgh tradition. The Best Actor and Best Actress each year go on to compete at The National High School Musical Theater Awards in New York City.

New Horizons is Pittsburgh CLO's musical theater training program for students with physical and developmental disabilities and autism. Barriers are broken down as the participants realize the power of art, music and theater and their own untapped abilities.

Creative Vision is Pittsburgh CLO's Partnership with the Pittsburgh Public School System and Propel Schools. Training in Dance, Voice and Acting combine with student creativity and accountability to promote participants' interest not only in the arts, but in themselves, their own lives and futures.

"A" in Arts is Pittsburgh CLO's way of recognizing excellence in school arts programs. Students trade in A's in high school arts classes for tickets to CLO's exciting mainstage productions at the Benedum Center.

Student Coupons are another way Pittsburgh CLO makes theater accessible to young people... Students see all six shows for only \$10 each. For more information call 412-281-2822.

For more information about these programs call 412-281-2234.

PITTSBURGH CIVIC LIGHT OPERA

The Benedum Center ■ 719 Liberty Avenue ■ Pittsburgh, PA 15222 ■ 412-281-3973 ■ Fax 412-281-5339
Academy of Musical Theater ■ Penn Avenue Place ■ 130 CLO Academy Way ■ Pittsburgh, PA 15222 ■ 412-281-2234 ■ Fax 412-281-2232
The Construction Center for the Arts ■ 415 Bingham Street ■ Pittsburgh, PA 15203 ■ 412-381-8185 ■ Fax 412-381-8214
The CLO Cabaret ■ 655 Penn Avenue ■ Pittsburgh, PA 15222 ■ 412-325-6766 ■ Fax 412-325-6768
mail@pittsburghCLO.org

pittsburghCLO.org