

# BLAINE AIRPORT PROMOTION GROUP

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8891 Airport Road C-2, Blaine MN. 55449

Fifth Year of Publication

## THE EDUCATION COORDINATOR NOVEMBER 12, 2015

Ben Franklin in France



The Declaration of Independence, the Treaty of Alliance with France, the Treaty of Paris and the United States Constitution are all major documents signed by Benjamin Franklin. He was an inventor but never patented his inventions and was always searching to increase efficiency and human improvement. Navigation, Electricity, The lightning rod, Wave theory of light, Meteorology, Concept of cooling through evaporation, Temperature's effect on electrical conductivity and Oceanography were many of the experiments conducted that lead to inventions that changed the way we live.

He was dispatched to France as commissioner for the United States in December 1776 and remained there until 1785. During his visit to France, peace negotiations began for the Treaty of Paris in April, 1783. The signing on September 3, 1783, by representatives of King George III of Great Britain and the separate peace treaties between Great Britain and the nations that supported the American cause; France, Spain and the Dutch Republic ended the American Revolution War. Collectively this is known as the Peace of Paris and its provisions were exceedingly generous to the United States in terms of enlarged borders.

As an avid scientist Benjamin Franklin was interested in new ideas and was following the progress of research by Jacques Charles of his ideas that Hydrogen would be a suitable lifting agent for balloons based on his study of Robert Boyle's 1662 published work. Jacques Charles had found that Oxygen, Nitrogen, Hydrogen, Carbon Dioxide and Air will expand and contract at the same rate, a relationship between pressure and volume when temperature is constant. ( $V \propto T$ ) (Charles Law) it's what makes balloons work. As a balloon rises, gases within the envelope expand, increasing volume as the atmospheric pressure outside decreases.

**Jacques Charles designed the first Hydrogen Balloon engineered by Anne-Jean Roberts and Nicolas-Louis Roberts.**

Hydrogen was selected for his first manned balloon flight based on its lighter than air density. The envelope was designed using silk and treated with dissolved rubber mixed in a solution of turpentine. The flight was promoted and daily reports circulated for the first un-manned flight scheduled for August 27, 1783, in Paris. That flight encouraged Benjamin Franklin so much that he

provided financial support to build a manned Hydrogen balloon scheduled for a December 1, 1783 flight. Franklin was seated in a special enclosure for honored guests to see this historic flight piloted by Jacques Charles and Nicolas-Louis Roberts that was viewed by an estimated 400,000 people. The flight plan included a barometer to act as an altimeter and a thermometer to make atmospheric measurements at height making this the first meteorological flight and the first time a human experienced hypoxia, a condition caused by a deficiency of oxygen during this 9000ft. high altitude flight.



### ELEMENTS OF BALLOON FLIGHT

The gas balloon is a sealed spherical shape and has one-fourth the internal volume of a hot-air balloon. The gas used is Helium or Hydrogen. A balloon can be maneuvered to climb by discharging ballast of sand or water and can descend by opening a gas valve in the top of the envelope.

The first manned hot-air balloon was designed by the Montgolfier Brothers and was launched on November 21, 1783, just ten days before the Jacques Charles gas balloon flight. The balloon rose to 50ft. and traveled five miles before the balloonist's feared that the burning embers of the smoky fire that provided lift would engulf their paper balloon.

### HOT-AIR BALLOONING

Hot-air balloons climb because the gas or warm air is less dense and therefore lighter than the air outside of the balloon's envelope. Unlike gas balloons the envelope does not have to be sealed at the bottom since the air near the bottom of the envelope is at the same pressure as the air surrounding the balloon. Hot air balloons use liquid propane and vaporize it to burn. The warming of the interior of the envelope gives the controlled lift and maneuverability of the balloon. Modern hot-air ballooning development and acceptance as a sport and competition is recognized throughout the world today and is one of the oldest forms of air transportation.

# COMMUNICATIONS

# STEP-SUCCESS THROUGH EDUCATION

The table was set with a variety of flight charts, sound equipment, an Edison spool record considered to be the first phonograph ever designed and electronic components. The objective was to provide a hands-on experience for young students that had as their goal to learn and design what a children's aviation museum should be like.

The centerpiece of the display was a game called "Hex-Bug". Its main feature was a small robotic toy that would travel through a maze. Only three robots were provided. I was thrilled to see one student remove one robot and sat on the floor to examine the robots movements more closely. Next, there were three students sharing the robot followed by their development of their own Hex-Bug game. Then there were eleven students and all the robots were being used, fulfilling our goal of providing a hands-on emphasis on group learning and cooperation.



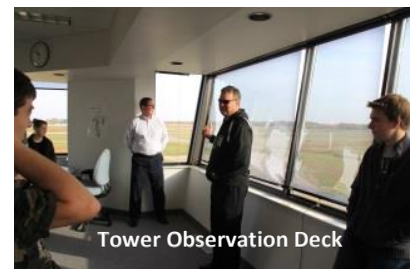
Staged at Golden Wings Museum

Mr. Peter Groebner is a STEP Instructor at Anoka-Hennepin District 11 High School conducting a class called Aviation Technology. The class starts with an aviation history unit and will work into the Private Pilot curriculum covering; ATC, Meteorology and Physiology all taught to the FAA private pilot standards.

STEP is a Secondary Technical Education program. This course offers students the opportunity to explore careers in aviation such as: pilots, air traffic controllers, aviation mechanics, airport service/management positions, aircraft dispatchers and meteorologists. Through hands-on simulations using air traffic control simulators and PC weather programs as well as the use of some of the airport facilities, students will gain basic information and knowledge on many aviation topics. Exposure to aviation weather, flight training, general, corporate and commercial aviation operations will help them in determining their career choice. Guest speakers and field trips are also included.

Mr. Peter Groebner is CFII, MEII (Multi-Engine Instructor Instruments rated). Aerospace Engineering (PLTW), Digital Electronics Engineering (PLTW) and Introduction to Engineering (PLTW).

Project Lead The Way (PLTW) is the nation's leading provider of K-12 STEM programs. This world-class curriculum and high-quality teacher professional development model, combined with an engaged network of educators and corporate and community partners, help students develop the skills necessary to succeed in our global economy. The U.S. Department of Commerce estimates that jobs in science, technology, engineering, and math (STEM) will grow 17 percent by 2018—nearly double the growth for non-STEM fields. By 2018, the U.S. will have more than 1.2 million unfilled STEM jobs because there will not be enough qualified workers to fill them. STEM is where jobs are today and where the job growth will be in the future.



Tower Observation Deck



R.C. Avionics



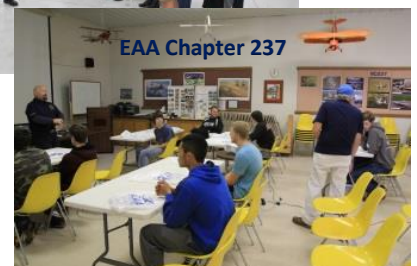
Cirrus Flight Operations



Twin Cities Aviation



Golden Wings Museum



EAA Chapter 237

**STEP Instructor Mr. Peter Groebner toured the Blaine Airport with his Aviation Technology Class**