

# BLAINE AIRPORT PROMOTION GROUP

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## THE EDUCATION COORDINATOR - SEPTEMBER 12, 2013

The first attempt of defining *Aerospace Engineering* is relatively new and was a response to the launching of *Sputnik*, a 58 cm (23 in) diameter metal sphere launched by the Soviet Union into an elliptical low Earth orbit on October 4, 1957. The satellite travelled at about 18,000 miles per hour and would complete an orbit of Earth in 96.2 minutes. It continued its orbit for 3 months before burning up upon entering Earth's atmosphere. This was a major world event that ushered in new scientific and technological developments along with political and military ramifications.

The Soviet Union initially kept a low-key response to this great accomplishment possibly to see what the world reaction would be to orbital satellite over-flights of other nations. This was a testing of the still uncertain legal status of orbital satellite over-flights.

The sight of *Sputnik 1* in their *SKY VIEW* inspired a new generation of future astronauts and engineers. On February 7, 1958, in response to the success of the *Sputnik* launch, the US Department of Defense established the Advanced Projects Agency and organized America's most brilliant people to go on to develop the first successful U.S. orbital satellite within 18 months.

### AEROSPACE

The first definition of *AEROSPACE ENGINEERING* appeared in February 1958, combining Aircraft (aero) and Spacecraft (space) into a description for this new era of aeronautical and astronautical engineering.

### AERONAUTICAL ENGINEERING

Aeronautical engineering was the original description of the pioneering work of Sir George Cayley. In 1799 Cayley provided the concept of the modern aeroplane and discovered and identified the four aerodynamic forces of flight which are weight, lift, drag, and thrust. Aeronautical engineering includes overlapping fields within the two branches of aeronautics and astronautics.

### AEROSPACE ENGINEERING

As flight technologies changed and advanced with new knowledge these advancements needed to be identified and formed into separate branches of engineering that would include orbiting craft and operations in outer space. In 1958 The National Aeronautics and Space Administration was founded.

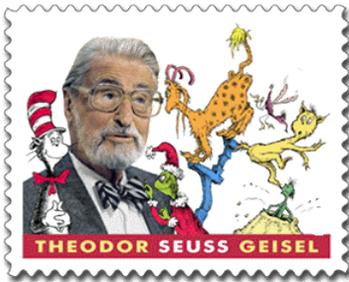
#### Elements of Aerospace Engineering:

- Fluid Mechanics
- Astrodynamics
- Static and Dynamics
- Mathematics
- Electrotechnology
- Propulsion
- Control Engineering
- Aircraft Structure
- Materials Science
- Solid Mechanics
- Aeroelasticity
- Avionics
- Software
- Risk and Reliability
- Noise Control
- Aeroacoustics
- Flight Test

*This is what STEM jobs in Aerospace industries look like. 20% of all jobs in the U.S. require a high level of knowledge in at least one STEM field.*

### WHAT'S IN YOUR SKY VIEW?

These STEM fields, including some in General Aviation, involve the study of scientific discoveries in design, construction, and testing of airframes and how they aerodynamically perform as well as the behavioral influence of airfoil design, control surfaces, lift, drag, innovative product design, and life cycle performance. Studies at the advanced diploma; bachelor's, master's, and PH.D. level are available at many U.S. universities as well as in mechanical engineering departments at others.



## ***What would you do if you were a who and didn't know what to do?***

This may not be one of Dr. Seuss's famous lines in his many memorable stories and books but this is a story about Deb Richards, the Edina Public School Gifted Education Coordinator and her staff that knew exactly what to do with highly-motivated students during a recent summer school camp.

Article provided by:

Edina Public School, Young Scholars Summer Camp

Inspired by the book Dr. Seuss, Oh, The Places You'll Go!, 150 highly-motivated participants of Edina Public School's Young Scholars Summer Camp devoted their first week of summer break to learning about transportation and the science involved in making things go. Campers in grades one and two learned about the advancement of air transit and how planes fly, while grades three and four learned about the physics behind roller coasters. Both groups started their camp with fun field trips to \*Golden Wings Flying Museum and Nickelodeon Universe, respectively, to see transit in action and to learn from experts.

Through these engaging activities, Young Scholars Summer Camp introduced students to topics in the fields of science, technology, engineering and math (STEM). Licensed teachers and other educators helped students develop design skills and encouraged imaginative thinking, all while broadening their minds about how the world around them works via real-life situations.

"The emphasis on hands-on learning helps campers be comfortable with STEM subjects, readying them for 21<sup>st</sup> century careers," said Deb Richards, EPS Gifted Education Coordinator. "We plan activities that are not only fun and engaging, but also stretch students' to places they may not have thought about."

At the conclusion of the camp, Young Scholars debut the prototypes they created with their peers. First and second graders used newfound knowledge to create a prototype air transit museum, focusing on the past, present, and future. The older students spent the week learning how to make their own roller coasters sturdy enough to lead a marble to the end of its course.

Another aspect of this program focused on helping students work well with peers of all backgrounds and abilities. Most of the activities throughout the week focused on working as a team to complete projects collaboratively. According to

Richards, many friendships and moments of pride came from this emphasis on group learning and team work.

EPS's state-funded Young Scholars program was established in 2010 to provide equity and access to gifted and talented services for students traditionally under-served in the district's program. Young Scholars uses a broader range of identification methods to find high potential students from under-represented populations. Teachers look for students who consistently demonstrate an exceptional ability to learn, strong application of knowledge, creative and productive thinking, and a motivation to succeed.

"It is a joy to coordinate a program that is so strongly supported by leaders in the Edina Public Schools," Richards said. "It's extremely gratifying to be a part of a team coming together to nurture the potential of so many motivated young learners."

\*In response to the Edina School's Young Scholars Summer Camp request and theme, Golden Wings Flying Museum and the Blaine Airport Promotion Group hosted the visit to the museum with our own theme, "IF WE HAD WINGS" based on a story of the men, women, and machines that changed the world by turning dreams of flying into a thrilling reality as the author, Ringer Buck gives the readers a tour through the history of flight.

A series of stops along the tour route through the museum of rare flying aircraft featured Meteorology for Pilots, Communications, Parts and surfaces of an aircraft, Bernoulli's principle, Wing design, Tools and how they work, Robotics, and the focus on team work as the students experienced a hands-on examination of the real life workings of a museum were rare airplanes have been restored to flying condition.



**Communications**



**Robotics**



**Bernoulli**



**Bird Wing Study**



**Parts/Surfaces of airplane**



**Meteorology for Pilots**

Photographed at Golden Wings Flying Museum by Roger Hansen