



CIVIL AIR PATROL
UNITED STATES AIR FORCE AUXILIARY

Aerospace Education Programs

NARCON 2014

Cocoa Beach, Florida

In the Beginning.....

In the late 1930s, more than 150,000 volunteers with a love for aviation argued for an organization to put their planes and flying skills to use in defense of their country.



As a result, the Civil Air Patrol was born one week prior to the Japanese attack on Pearl Harbor.

World War II Achievements

- Assigned to the Army Air Corps.
- Volunteers logged over 500,000 hours of flight time.
- Sank two German submarines in coastal waters.
- Performed search and rescue for victims of aircraft crashes and ship sinkings.

Legislative Authorities

- On July 1, 1946, President Harry Truman signed Public Law 476 incorporating Civil Air Patrol as a benevolent, nonprofit organization.
- On May 26, 1948, Congress passed Public Law 557 permanently establishing Civil Air Patrol as the auxiliary of the newly created USAF.

Our Mission

- Emergency Services
- Cadet Programs
- Aerospace Education



Emergency Services

- Search and Rescue as directed by the USAF Rescue Coordination Center at Tyndall AFB
- Disaster Relief
- Humanitarian Services (ARC)
- Air Force Operational Support
- Counterdrug Activities (DHS, DEA)



2013 Operations Accomplishments

- Flew 95,137 hours and made 44 rescues.
- Flew support for 58 disaster relief operations.
- Flew 1,258 hours of air defense intercept missions for the USAF.
- Flew 7,018 hours of counterdrug and drug interdiction activities and support.
- Flew 1,114 hrs of Surrogate Predator operations in support of Air Combat Command.

SAR Advanced Technologies

- Satellite Toolkit (STK) – uses AGI's mission modeling and analysis software and to track and utilize SAR satellites, aircraft and ground assets.
- Airborne Digital Imaging with satellite links and real-time processing.
- Airborne Real-time Cueing Hyperspectral Enhanced Recon (ARCHER) utilizing signature, anomaly and change detection modes.

Cadet Programs

- 16-step program including aerospace education, leadership training, physical fitness and moral leadership.



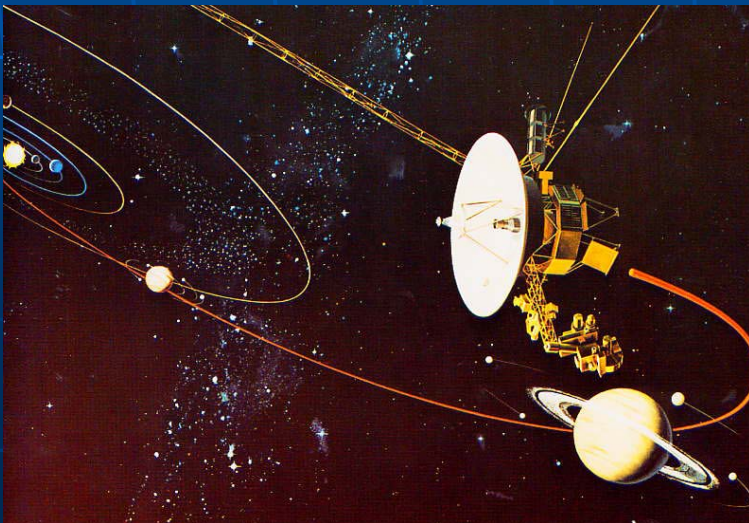
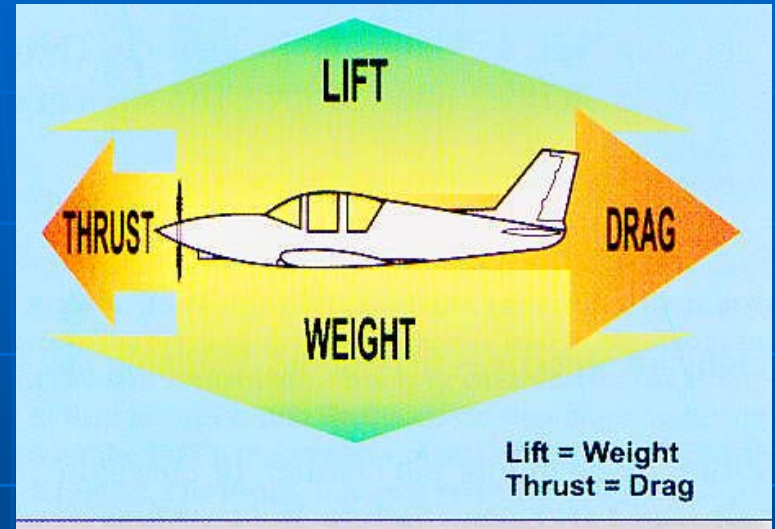
Cadet Orientation Flights

- To ignite interest in aviation, CAP continues to provide both powered and glider orientation airplane flights for CAP cadets.
- Program extends to USAF JROTC and ROTC Cadets.
- Cadets can work towards earning a pilot's license.



Aerospace Education

- Volunteer Adult CAP members
- Cadet Programs
- General Public





Civil Air Patrol STEM Kit Program

funded by

**National Defense Education Program
Air Force STEM Outreach Coordination Office**



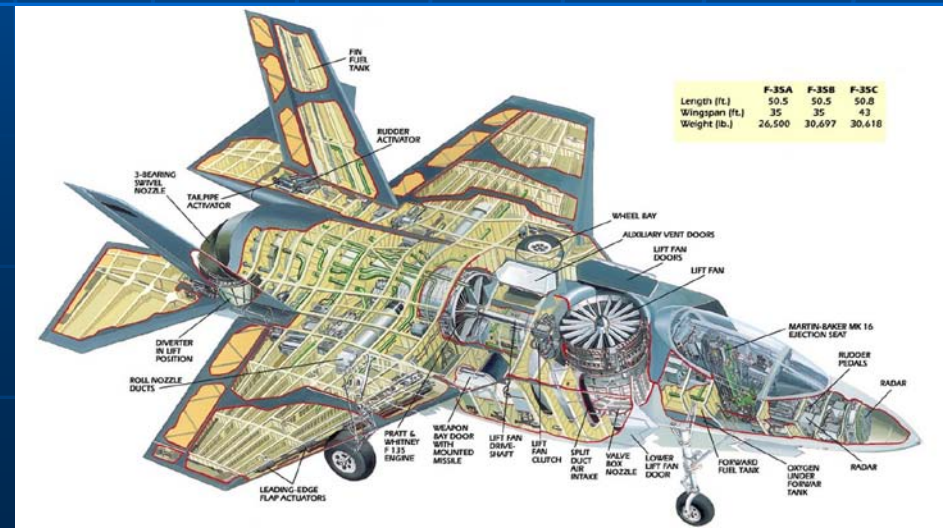
Aerospace Dimensions Modules



- Primary Tool for delivering aerospace education to cadets.
- Stand alone lessons required for advancement in grade from Cadet Airman to Cadet Chief Master Sergeant.

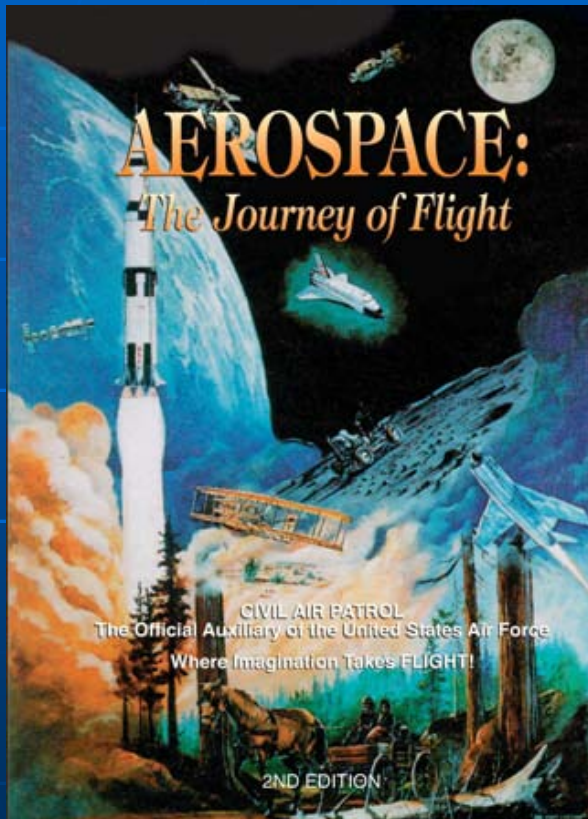
Aerospace Dimensions Modules

- Introduction to Flight
- Aircraft Systems and Airports
- Air Environments
- Rockets
- Space Environment
- Spacecraft



The Journey of Flight

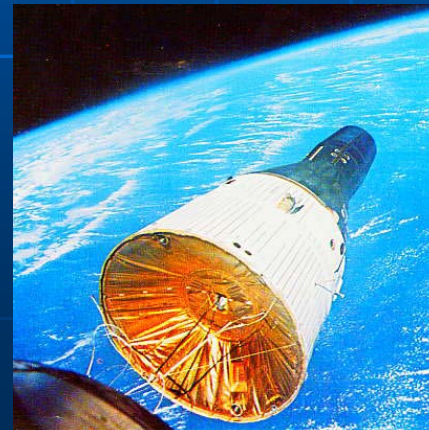
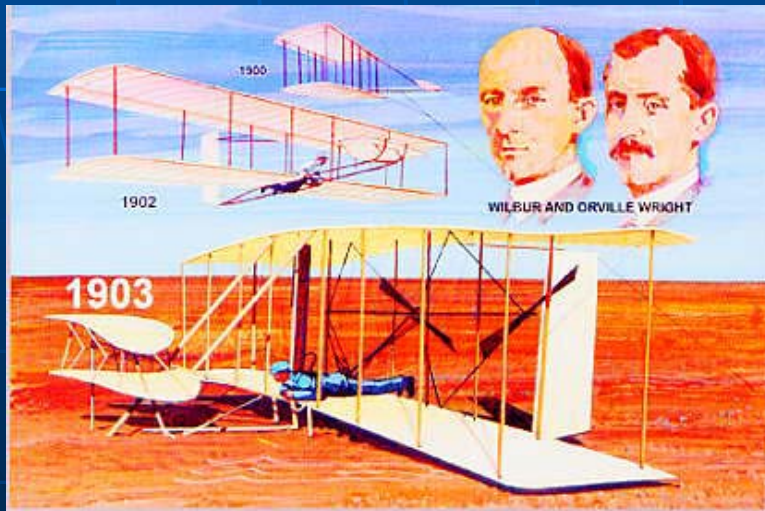
The Charles E. 'Chuck' Yeager Award



- Aerospace Education Program for Senior Members (AEPSM)
- Covers advances in early aviation and rocketry from early balloons and the invention of gunpowder and simple rockets to present day technologies.
- Self-study program for adult members. Required for grades above Captain.

Programs for Teachers

- Teacher orientation flights in CAP aircraft
- Aerospace Connections in Education
- Aerospace Education Excellence



Teacher Orientation Program Flights (TOP)



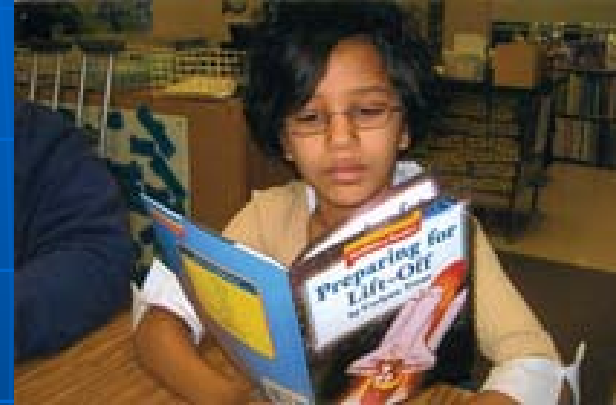
- Available to all Aerospace Education Members.
- Uses flight as a platform for conveying to teachers the use of aerospace activities for teaching STEM.
- Provides aerospace knowledge, confidence, and excitement that is transferred back to the classroom.
- Gives teachers a hands-on flight experience.

Aerospace Connections in Education (ACE) Program

- A free aerospace education program for CAP members that teach K-6.
- Provides educators with engaging, aerospace lessons and activities that support STEM education.
- A grade-level specific set of 21 aerospace-themed lessons.
- 600 teachers and 17,000 students participating in the 2013-2014 school year.
- Funding from the Air Force Association, Lightspeed Aviation Foundation and FLIR Systems, INC.

Aerospace Connections in Education (ACE) Program

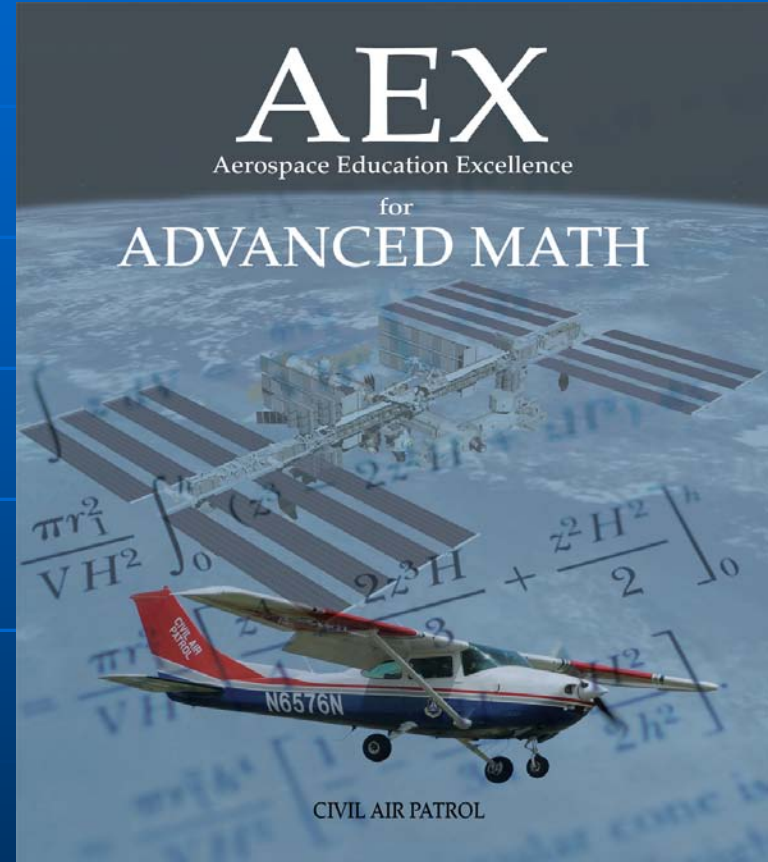
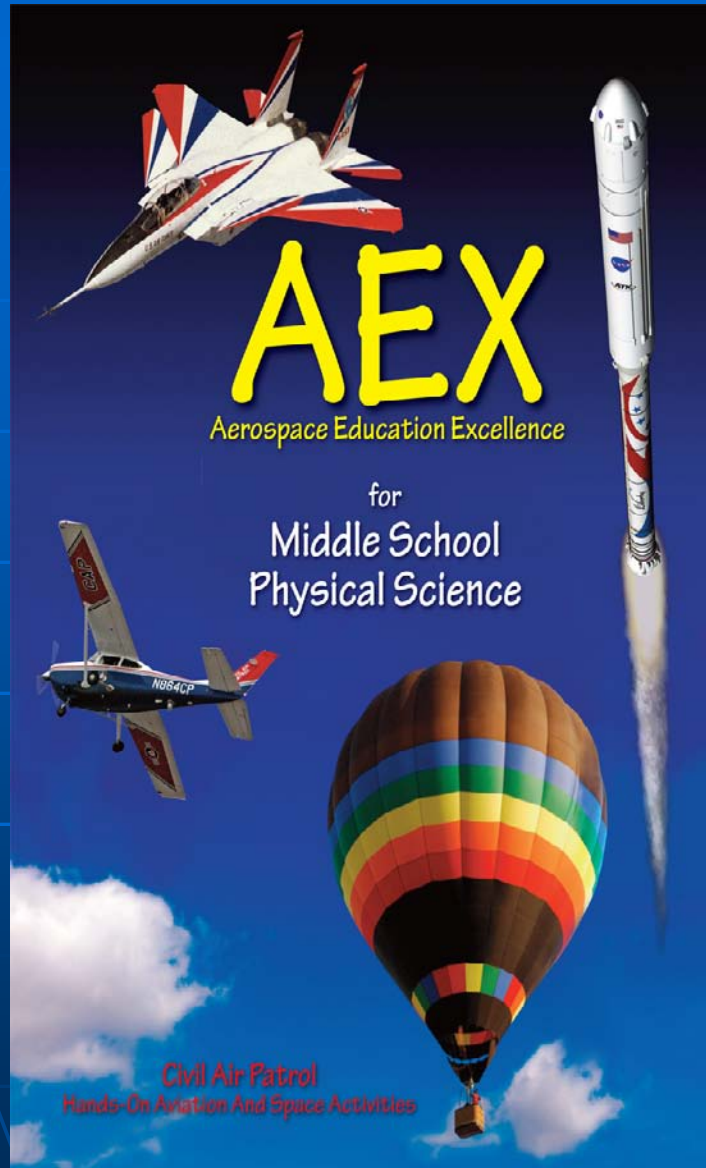
- 90% of educators complete the program.
- 46% increase in student knowledge and interest in aerospace.
- Improves standardized science test scores.



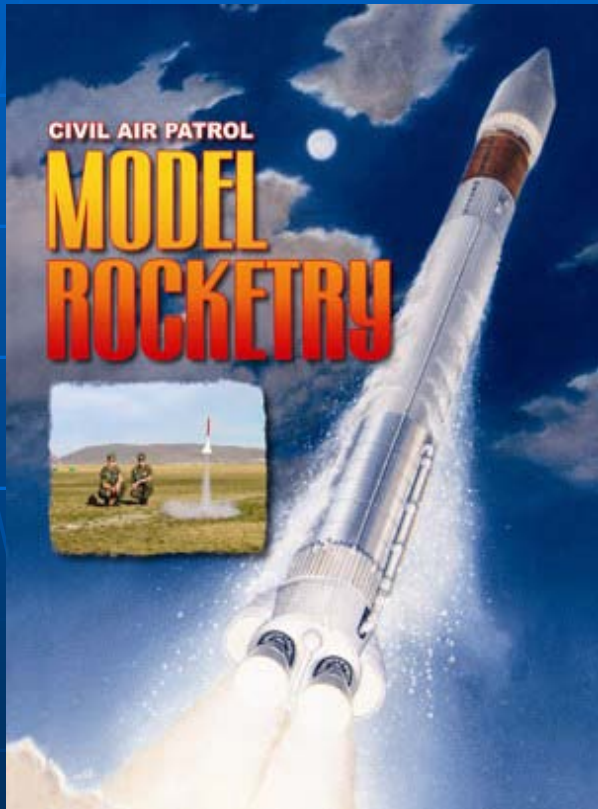
Aerospace Excellence Education Program (AEX)



- Free program to teacher members (AEM)
- Provides national standards-based aerospace hands-on activities.
- Activities are designed to fit into any curriculum.
- Teach friendly using low cost materials for activities.
- Separate K-5 and 6-12 materials.



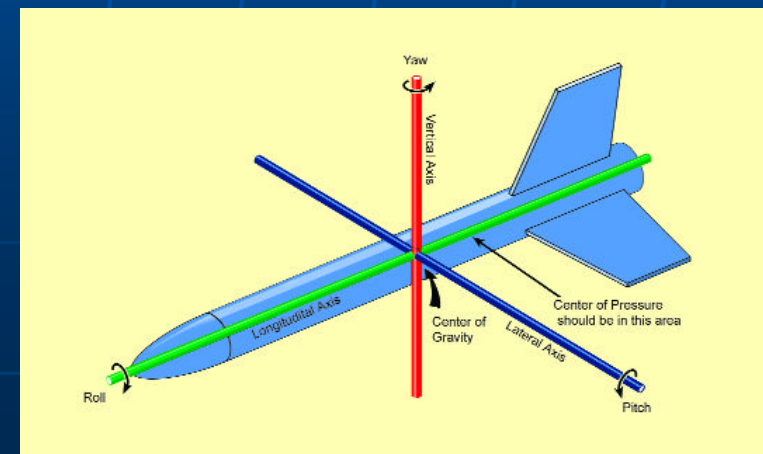
Model Rocketry Program



- **Redstone Stage** reviews the history of rocketry and its great pioneers.
- **Titan Stage** details the physical laws which govern objects on the Earth, in the air and in space.
- **Saturn Stage** presents information on altitude tracking, and physics of impulse and thrust.

Model Rocketry Program

- Build and fly a single stage scale model.
- Build and fly a payload rocket or two-stage rocket
- Demonstrate how to track altitude
- Emphasizes the NAR Safety Code



Redstone Learning Objectives

- Identify historical facts about the development of rockets.
- Describe the major contributions of the four great rocket pioneers.
- Recall facts about the rocket pioneers' lives and accomplishments.
- Design, build and launch two non-solid fuel hands-on rocket options.



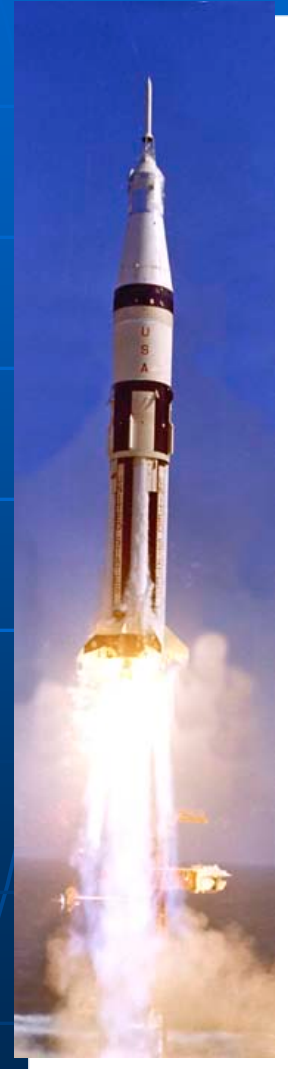
Titan Learning Objectives

- Explain Newton's three Laws of Motion.
- Describe the aerodynamics of a rocket flight and recovery.
- Build and launch a single stage scale model rocket (Estes Patriot).
- Demonstrate knowledge of the NAR Model Rocket Safety Code



Saturn Leaning Objectives

- Determine a model rocket's altitude.
- Describe the structure of a model rocket motor (black powder and composite).
- Understand motor coding (total impulse - avg. thrust – delay)
- Build and launch a two-stage model rocket (Estes Long Tom).



Team America Rocketry Challenge (TARC)



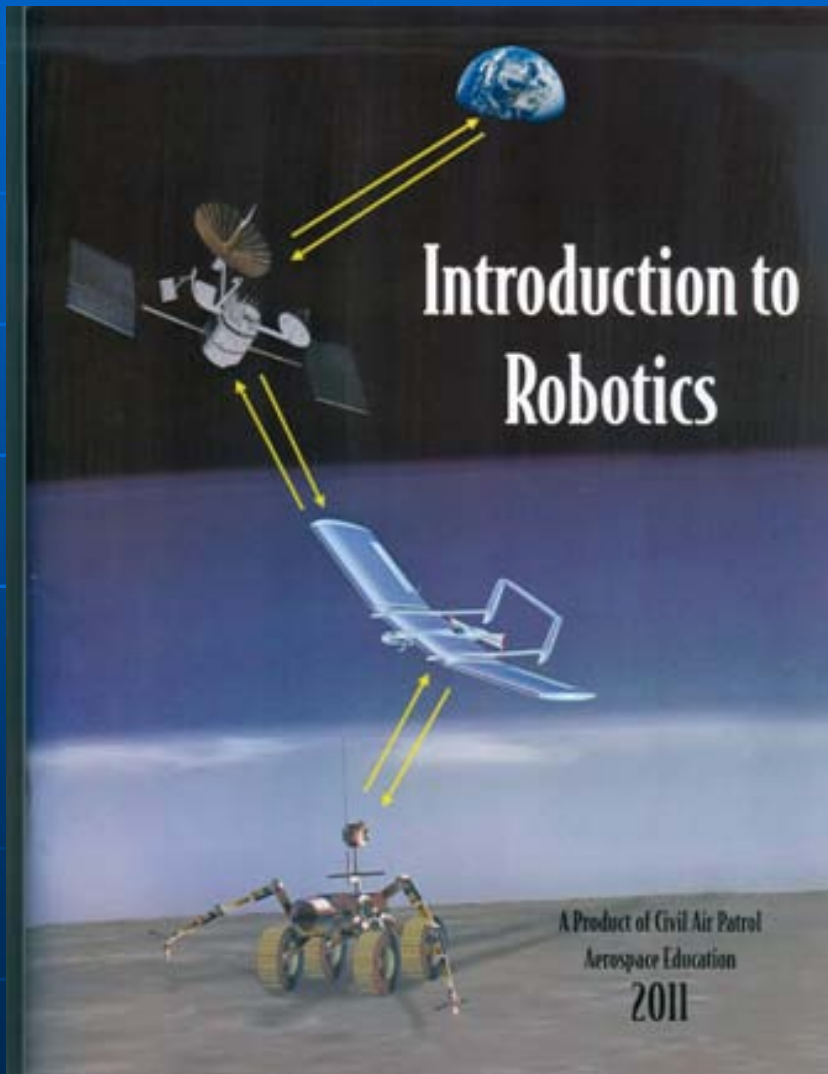
Why TARC for CAP Cadets?

- This event is an annual nation-wide rocketry-based aerospace design and flying challenge competition for student teams of 7th-12th graders.
- The purpose of the Challenge is to teach students aerospace science and systems engineering by having them design, build and fly a safe and stable model rocket on a prescribed mission.
- Represents a logical program beyond the CAP Rocketry Program.

2013 National Fly-Off



New Directions - Robotics



- Curriculum provides an introduction to robotics and encourages young people to explore robotics technologies.
- Provides beginning activities that are low-cost and high-interest.
- Activities progress into challenges requiring more resources and ingenuity.



New Directions

SATELLITE TOOLKIT (CAP-STK)

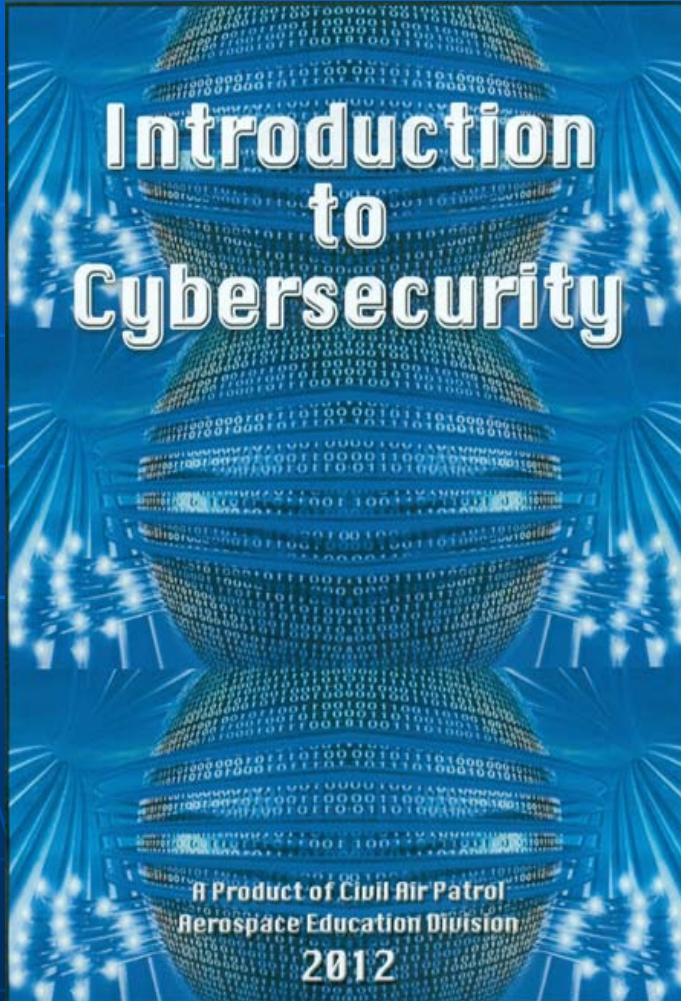
AEROSPACE PROGRAM

- Orbital mechanics
- Orbit orientations
- Space operations
- Space assets and systems missions



Designed to educate cadets on the exciting aspects of satellites, satellite orbits, the types and locations of orbits, and satellite missions using Analytical Graphics Incorporated (AGI) state of the art computer application, Satellite ToolKit (STK).

New Directions - Cybersecurity



- Traditional domains of military conflict considered as land, sea and air
- 2002 –space was added to list
- 2010 – cyberspace was added

Introduction to Cybersecurity Module



- Gathering cyber intelligence
- Cryptography
- Threat and vulnerability assessment
- National High School Cyber Defense Competition

How to Participate?

- **Aerospace Education Officer**
Work as uniformed CAP members with cadets & adults in squadrons across the nation
- **Aerospace Education Member**
Work as educators in schools & youth organizations
- **NAR TARC Mentor or Leader**

Revealing Statistics

- National Cadet Count: 24,681
- National Senior Count: 34,125
- Number of CAP units: 1,500
- Number of CAP units with Registered TARC Teams in 2014: 3

Polaris Squadron, Alaska

Monticello Composite Squadron, Virginia

Martinsburg Composite Squadron, West Virginia

Thanks for Listening....
Any Questions???

