

Aerospace Adventures

Supporting School-Age Accreditation and Quality Programming

Aerospace is a great way to incorporate science activities into the School-Age program. *Aerospace Adventures* guides are full of long-term activities that encourage higher level thinking skills. The activities are easy to understand, with everything you need (materials and supplies) stated at the beginning of each activity. All it takes is an adult who is excited about the project and is willing to take a little time to read the project books, think about the activities and develop some thought-provoking questions.

Essential Elements of 4-H Youth Development

Youth involved in 4-H know they are cared about and feel a sense of **BELONGING**; they exercise **INDEPENDENCE** by using decision-making and action to influence people and events; they develop a sense of **MASTERY** by learning skills needed in making positive career and life choices; and they experience **GENEROSITY** by helping others through community service. These elements support the Army Youth Development Components of Belonging, Success, Service and Independence.

Ideas! Ideas! Ideas!

Brainstorming with children, youth and parents is a great way to generate a list of ideas for field trips, speakers, and websites. Here are some examples:

- Invite a local pilot to speak about his job.
- Take a trip to the local airport to see the different jobs and activities necessary to keep people flying.
- Invite an air traffic controller or Transportation Security Administration worker to speak about their jobs.
- Learn about airplane mechanics and what they need to know for their job.
- What is life like at an airport over a 24 hour period of time? Create a time-lapsed video to tell the story.



Opportunities for Youth Leadership and Development and Cross-age Teaching

Older youth can serve as project helpers to younger youth by helping them set goals and encouraging them to complete them. Older project members can host skillathons or a week at summer camp to help children and youth learn what is involved in aerospace.

Providing Quality Middle School and Teen Programming

Teens will get excited about aerospace when they can make something that really flies. Help them to design and build hot air balloons or rockets and then have a launching day to show off what they learned. Choose activities where teens can work together and engage in higher level thinking projects. Through the use of hands-on activities, youth learn about aerospace and the jobs that are related to the aerospace industry.

Community Service/Service Learning Opportunities

There are many opportunities for community service with *Aerospace Adventures*. Check the local airport to see if the group can help with planting flowers to welcome visitors or by cleaning up an area of the airport. The local hospital may need help organizing supplies for "life flights." Or, work with others to sponsor a World War II veteran for an Honor Flight.

Summary

It's not necessary to be an expert to lead the 4-H *Aerospace Adventures* project. Read through the materials, try out the activities and increase personal skills in aviation. By talking about what they have learned, 4-H members will extend their aerospace skills and develop their ability to think critically about their experiences.

THE Army 4-H EXPRESS GUIDE TO Aerospace Adventures



Flying like a bird sparks enthusiasts to explore and imitate the wonder of flight. In *Aerospace Adventures* youth have fun while learning about things that fly - kites, hot air balloons, remote control airplanes, gliders, and rockets. Who knows, this project may be the first step to a career in aviation.

Project Goals

Aerospace Adventures focuses on developing skills for a lifetime. They are designed to be developmentally appropriate for grades 3-12 but may be used with youth in any grade level based on their project skills and expertise.

Four Fun Activities

1 Kite flying enthusiasts call it a “Puller.” It’s when the kite pulls so hard it begins to move the person across the ground. In **Lift Off, Angle of Attack, pages 22-23**, children build and fly a Diamond kite and experiment with “Pullers” and “Floaters.”

2 It just may be rocket science! In **Reaching New Heights, Rippin’ Rockets, pages 6-7**, youth experiment with the design of a balloon rocket until it flies in the predetermined direction.

3 You’re the pilot now; a radio control (R/C) model plane pilot, that is. These models use the same control surfaces as a full scale aircraft; the only exception, no rudder pedals. In **Reaching New Heights, Mustangs to Zeros, pages 28-29**, youth use the information provided to discover more about R/C parts and functions.

4 Imagine floating above tree tops through the clouds and listening to the wind in a hot air balloon. **Flight Crew Helper’s Guide, Full of Hot Air pages 32-33**, helps youth build a hot air balloon and learn the concepts of balloon flight at the same time.



Experiential Learning

Experiential Learning engages children and youth while they learn, share, and grow through their 4-H experiences. With an adult as the coach, the first step is “doing” or exploring. Next, youth share what they did and discuss the experience with their peers. After they’ve identified the skills and knowledge gained, help them determine how to apply these to other situations in their lives. Start with these questions related to aerospace.

What makes a hot air balloon rise?

What are some careers related to aerospace?

Why do planes have wings?



Project Activity Guides and Target Age Groups

Preflight, Stage 1 is designed for children grades K-2. Children learn how to talk like a real astronaut, find out how an airplane works and have fun at the same time.

Lift Off, Stage 2 is for children grades 3-5. In this stage children fly kites, participate in airplane contests, launch rockets, explore space, make gliders, construct straw rockets and experience disorientation.

Reaching New Heights, Stage 3 is designed for youth grades 6-8. Youth learn to fly an airplane, launch a rocket, conquer space and become an astronaut or pilot. They also make a shuttle on a string, a Japanese kite, a hang glider and a control panel of an aircraft.

Pilot in Command, Stage 4 finds youth, grades 9-12, creating their own altitude tracker, determining the most fuel-efficient routes between airports and making a box kite. They will also explore pilot certification requirements, evaluate past and present navigation systems, learn about airport issues in their community and explore aerospace careers.

Flight Crew, Aerospace Helper’s Guide provides group oriented experiences that will keep youth coming back for more. Many activities are included in this guide for hands-on experiential group fun such as an aerospace quiz bowl, skillathon and airport field day.

Aerospace CD-ROM includes a complete set of aerospace materials for individual users.

Related 4-H Projects

There are several 4-H projects that relate to 4-H *Aerospace Adventures*. Practice flight simulation in the computer project; learn more about remote control technology through the robotics project; and children and youth document their aerospace work the photography project.

Life Skills

“Skills that help an individual to be successful in living a productive and satisfying life” are identified as Life Skills (Hendricks, 1996). Communication, leading, learning, critical thinking, planning, keeping records, and building self-esteem are all valuable skills taught in *Aerospace Adventures*. While only one life skill is targeted for each activity, youth will have the opportunity to practice several skills.

Character Connection

It’s not necessary to look any farther than the U. S. Astronauts to see role models of good character. Encourage children and youth to learn more about these men and women and follow their lead in being Trustworthy, Respectful, Responsible, Fair, Caring and good Citizens. Soon these young people will be role models for others.



Linking to the Army’s Four Service Areas and Baseline Programming

Sports, Fitness and Health Options

Weightlessness may look fun, but it takes lots of physical training to become an astronaut. Learning how astronauts stay fit certainly fits into this Service Area. Discover how to monitoring heart rates in **Pilot in Command, Astronaut Aerobics, pages 18-19**.

Arts, Recreation and Leisure Activities

Flying kites, hot air balloons, airplanes and rockets can certainly be a recreational and leisure activity. Kites have a particularly interesting history in how they are decorated. **Reaching New Heights, Flying Fighters, pages 24-27**, provides directions for building a Nagasaki Hata Fighter kite and explains how they are traditionally decorated.

Life Skills, Citizenship, and Leadership Opportunities

“Life flight” helicopters serve a particularly important role. Consider all the people and the skills needed to determine if and when to bring this type of service to a community. **Pilot in Command, Care in the Air, pages 24-25**, provides activities which show how hospitals select and use helicopters as a way to save lives.

Academic Support, Mentoring, and Intervention Services

What does it take to be a pilot, astronaut, or any of the support positions such as airplane mechanic, computer engineer designing controls, or in the business of running an airline? There are many vocations to explore in the aviation industry. The self assessment in **Pilot in Command, My Personal Qualities, pages 30-31**, is a good place to start evaluating interests that could turn into career opportunities.

Integrating Technology

Technology and aerospace go hand-in-hand. Aerospace includes everything from aircrafts, guided missiles, space vehicles, aircraft engines, propulsion units using a flight simulator, GPS/GIS, and much more.

Here are a few websites with additional information about aerospace.

- <http://quest.nasa.gov/aero/kids/index.html>
- <http://www.boeing.com/companyoffices/aboutus/kids/>
- <http://www.kathimitchell.com/astron.htm#General%20Sites>
- <http://botw.org/top/Science/Technology/Aerospace/>
- http://www.kids.gov/6_8/6_8_science_flight.shtml
- <http://www.aiaa.org/content.cfm?pageid=473>
- <http://www.aviation-for-kids.com>

