



Flight Crew Helper's Guide



Aerospace Group Activity Guide

Name _____

County _____



REVIEWED & RECOMMENDED
National 4-H Curriculum



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Launch Pad

Flight Crew Helper's Guide

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Flight Crew Helper's Guide

Aerospace Quiz Bowl
Aircraft Fire Rescue
Afterburner
Top Gun
Far Out!
Community Airport Field Day
Flight 777
Aerospace Experts
Traffic Cop in the Sky
Space Station Skillathon
Aerospace Alphabets Games
Touring An Airport
Full of Hot Air

Note to the Project Helper

The excitement and dreams youth experience in sending a rocket into space, making a first solo flight, becoming an astronaut or perhaps someday visiting other planets provides the vehicle for you to involve them in significant youth development experiences to help them prepare for life. This guide has been designed by aerospace and extension educators from across the nation to support you, as commander of the flight crew, to give leadership to a group of youth interested in exploring aerospace. *Flight Crew* includes hands-on experiential activities as well as information and resources to help you develop additional group activities. Youth from grades K to 12 can participate in most of the activities.

Your Role

- Review this guide and the four youth activity guides in the aerospace series
- Involve youth in planning and conducting a minimum of five to ten group experiences
- Support youth in their efforts to set goals and complete the aerospace achievement programs found in each of the youth guides
- Serve as a resource person to help connect youth with the community, resource materials and others knowledgeable about aerospace

Your role is basically to help young people "learn for themselves" by engaging them in learn-by-doing activities that promote their acquisition of skills and knowledge. The ways in which youth share information, or reach agreement about an issue will in itself be a learning experience. Many experiences will require them to reflect upon their own interests and background, and how those relate to the activity and the life skill practiced.

Each participant will bring his or her own set of understandings to the activities outlined in this guide. The differences in backgrounds, maturity levels, levels of self awareness and prior knowledge about the subject matter may be quite wide. It is important to respect each person's knowledge, abilities, skills and talents, and to acknowledge that everyone has something to contribute.

The Aerospace Adventures Series

A total of five pieces are available in the Aerospace Adventures Series. The first four youth activity guides, Pre-Flight, Lift-Off, Reaching New Heights and Pilot in Command have been designed to be developmentally appropriate for grades K-2, 3-5, 6-8 and 9-12 respectively but may be used by youth in any grade based on their aerospace skills and knowledge. This fifth piece, Flight Crew Helper's Guide, has been designed to provide group activities that can be organized very quickly and conducted with a group of usually three to fifteen youth. The information in this guide is useful to organize a youth aerospace program in the community. Included are hints on financial support, organizing a sign-up night, providing recognition and much more. Leaders of groups will also find this an excellent resource.

Expected Outcomes

The overall objective of the series is to help youth practice workforce preparation skills while they explore aerospace related subjects. Positive outcomes in both of these areas are important. In each activity youth practice one or more of the following skills:

Workforce Preparation Skills

- Improve youths' ability to reason, think creatively, set goals, make decisions, take initiative, solve problems, evaluate progress, work effectively in diverse teams, teach others, lead and negotiate
- Involve youth with family members, mentors and helpers in the community
- Help youth understand different types of work, discover personal interests, skills and develop steps to achieve their goals

Aerospace Skills

- Develop skills and knowledge in the areas of aviation, space, kites, hot air balloons, weather and aerospace careers
- Connect youth with aerospace educational resources and opportunities
- Explore current issues related to aerospace

Evaluating the Experience

Each activity can be evaluated during the debriefing session based on the understanding the youth have about the aerospace content and the work life skill practiced. The completion of each achievement program is the final evaluation. The aerospace helper's initials on the achievement programs indicate that the activity has been successfully completed. A useful tool in evaluating success indicators can be found on page 35, Evaluating the Impact.

Good luck in your role as the leader of an aerospace group.

Steps to a Successful Aerospace Program

If you have taken a long, hard look at the 4-H Aerospace program and decided there is more to do than you as one volunteer can do, you may want to expand your volunteer base and involve others. All youth in the project should identify and recruit a “helper” to assist with completing the project activities. However, there are other ways volunteers could help expand the 4-H Aerospace Program!

- **Identify a key leader or leaders in your county.**

Every county has some people who are interested in aerospace and willing to share their interest with kids. The challenge is to locate people who have contacts in the aerospace community and are willing to assist in putting the program together by providing leadership, even if they will not be involved in teaching the young people directly.

- **Identify a group of potentially interested persons in cooperation with your key leader(s).**

Search outside the current 4-H leadership as well as within it. Seek to identify a group of people who are willing to work with the program in some capacity. Note that you will need fund-raisers and organizers as well as active helpers with a variety of skills. Look for people with an interest and a willingness to put kids first.

- **Invite the group of potential leaders to an initial meeting to discuss organizing a aerospace group in your county.**

Discuss the program and its objectives and note that it will not be a success without a dedicated corps of volunteers. Cover the program content, objectives and role in youth development plus any county rules and regulations. Cover any county rules and regulations. Have them sign up as county volunteers before starting to work with the program.

- **Meet with the people who want to form a county leadership team.**

Meet to form a preliminary plan and to determine who and how many will attend a workshop to learn how to share their interests with kids in an effective manner. Note that having this training provides some protection from liability as well as helping them to determine what to share and what to leave out for kids at various stages of development. Re-emphasize the youth development nature of the program.

Additional information about the Aerospace Series can be found on the internet



Explore more at
www.4-hcurriculum.org
National 4-H Curriculum

Your county extension office can provide many tips and ideas how to organize a volunteer support program. Most importantly, people cannot have the opportunity to volunteer if they do not know your needs and are never asked. The steps to a successful aerospace program described below includes many helpful hints.

- **Develop the necessary support for the program: human, financial and material.**

Dream big while having a firm grip on reality. It may take some time to get the program running at the level all parties desire. Knowing that something positive is happening while the ultimate plan is being developed helps the participants to move forward.

- **Set the plan in motion by recruiting leaders and youth.**

Recruitment is seldom a problem for the aerospace program. Nearly every pilot would like to share his or her passion with kids, and nearly every kid will find something to like about the program. Developing a volunteer position description is a starting point for more adult involvement.

- **Include advanced youth as junior or teen leaders.**

Kids leading kids works! It is also a progression in responsibility that will aid in the development, satisfaction, and long-term participation of older, more experienced young people. Involve them and watch the program grow!

Make safety a priority!



Evaluating Your 4-H Aerospace Program

Ideal youth programs share several elements. Such programs are attractive to kids, parents and other volunteers. The leaders are well prepared, positive and understand the objectives of the program. They guide program direction, and involve the participating young people in determining the exact nature and content. All participants strive to expand their interests, skills and competencies.

Youth development and the growth of youths' coping, competency and contributory skills are the foundation of the program. These skills are integrated into a matrix with fun, pertinent, informative and positive activities valued by young people. Parents and older youth are actively involved and given increasingly responsible

duties. Relationships are more important than skills, achievement or awards; and those who lead and guide the program ensure that the priorities remain in order. Finally, the groups are kept small with a high ratio of leaders or coaches to young people to facilitate building relationships, mentoring and role modeling.

The Center for Early Adolescence in North Carolina has identified seven developmental needs considered central in the growth of 10 to 15 year-olds. These needs provide a very useful checklist or framework for the analysis of youth programs. Two of these, "Positive Social Interactions with Peers and Adults" and "Structure and Clear Limits" are considered most critical.

Developmental Needs of Youth

1. Physical Activity

Young adolescents need to move. Giving them active things to do and excusing their inability to sit still are ways of recognizing the need for physical activity.

2. Competence and Achievement

Young adolescents have a strong desire to do things well and to be recognized for their accomplishments. Providing opportunities to achieve success, especially situations in which everyone can succeed in his or her own unique way, can help to meet this need.

3. Self-Definition

Rapid changes characterize the teen years and young adolescents spend a good deal of time trying to figure out who they are. They need opportunities to explore being an adolescent instead of a child, belonging to a gender, race, ethnic group, or social category in which they fit, and what their new physical and mental abilities will allow them to do. Providing for the exploration of a variety of ideas, skills, crafts, volunteer activities, careers, and games will facilitate growth in this area and help young people avoid dangerous risk-taking as a means of self-definition.

4. Creative Expression

During adolescence, young people begin to identify what makes them unique and what an individual creates, whether it is written, played, grown, painted or performed. Although not all young people are artistic or musical, all young people can create something unique and special. Excellent youth programs help young people find that creative outlet in which each can shine.

5. Positive Social Interactions with Peers and Adults

Most adults understand that young people need to have positive interactions and friendships with other young people, but they are skeptical about young people's desires to be with adults. Young people themselves admit their parents, families, and other adults are of primary importance in setting values and giving affection. The best programs offer accessible and responsible adults with whom the young people can interact, and provide interaction with peers that is supportive and builds social skills.

6. Structure and Clear Limits

Young people want to know what the expectations are for their behavior. If the structure is too loose, they will not know what to expect and will react out of a sense of insecurity. If the rules are clear, they may, and probably will, test them, but they want and expect consistent reinforcement of those rules. At this age they want and can handle participation in defining those limits and setting the structure.

7. Meaningful Participation

Good youth programs are designed WITH young people, not for them. The experience of taking responsibility for programs in which they participate helps to develop adult skills and increases commitment to the programs. Although their commitments are likely to be short-term, allowing them a chance to participate meaningfully in their communities by doing social service projects, volunteering or serving on advisory boards will help both the adolescents and their communities.

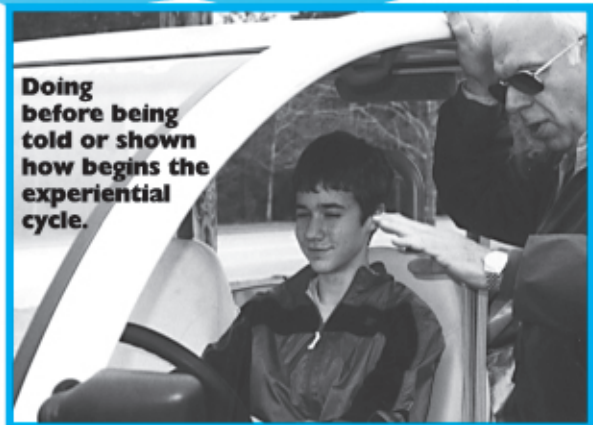
Ages and Stages of Youth Development

Not all people develop in the same way at the same age. But there are certain patterns to youth development—certain “ages and stages” that are commonly experienced by most youth.

Grades 3–5	
Characteristics	Helper Tips
Learn best when physically active	Allow youth to participate in activities where they can use physical energy.
Have a special attachment to older youth	Allow youth to choose an older youth to be their helper and role model.
Are easily motivated	Use encouragement to keep them motivated.
Reading becomes an individual experience	Allow time for youth to read on their own and think of activities before working with others.
Attention span is about 45 minutes	Use varied activities to keep them interested.
Acceptance by peer group is important	Use the peer group to recognize good work, such as applauding completed activities and avoiding put-downs.
Interests expand from home, to neighborhood to community	Talk to youth about their friends and neighbors and what goes on in their community. Involve them in community service.
Enjoy both cooperation and competition	Plan activities so that sometimes youth work together, sometimes compete with each other.
Show independence by seeking individual attention and sometimes disrupting the group	Involve youth in selecting activities they would like. Give individual attention as needed.
Feelings of competence enhance self-concept	Provide activities that will let youth feel good about themselves and succeed. Recognize them for their accomplishments.
Show loyalty to members of their own sex and antagonism toward those of the opposite sex	Involve youth in choosing partners.
Grades 6–8	
Characteristics	Helper Tips
Can take responsibility in planning and evaluating their own work	Give youth responsibility for group activities, including planning, implementing and evaluating.
Can plan their own social and recreational activities	Provide opportunities for youth to work together. Form committees to plan recreational and social activities.
Can discuss current events, international affairs and social issues with some help	Use discussion, activities and games that encourage awareness of current events and issues.
Want to make decisions but still depend on adult guidelines	Establish guidelines that give parameters for youth to follow.
Gain skills in social relations with peers and adults	Provide activities which foster social interaction with peers and adults.
Peer pressure mounts, first from same sex, then from the opposite sex	Use peer pressure to influence positive behavior. Have group give encouragement to individuals.
Can be quite self-conscious	Avoid asking youth to share their work individually until they feel more comfortable with the group.
Strong emotional attachment to older youth and adults	Encourage youth to participate in activities with older youth and adults.
Choices are often unrealistic	Assist youth in making realistic choices. Review their plans, discuss alternatives and help them weigh options before making decisions.
Grades 9–12	
Characteristics	Helper Tips
Personal philosophy begins to emerge	Use activities where youth search for experiences which will allow them to identify their own philosophies.
Enjoy discussing world situations as well as personal activities	Encourage discussion of events and feelings.
Abstract thinking and problem solving reach a higher level	Put youth into real-life problem solving situations.
Strong desire for status in peer groups	Develop a climate in which youth are encouraged and supported by peers.
High interest in social activity	Encourage youth to plan and carry out their own social activities.
Need freedom from parental control to make decisions	Help youth realize that their decisions have consequences.
Widespread feelings of inferiority and inadequacy	Encourage and help youth see their positive worth.

Teaching and Learning Experientially

The 4-H Youth Development Program promotes the concept of learning-by-doing before being told or shown how. A five-step experiential process helps turn activities into learning experiences. The experiential process of learning engages youth in the activity, encouraging them to think more, explore, question, make decisions and apply what they have learned. You will note that each of the activities follows this five-step model.



I. Experience

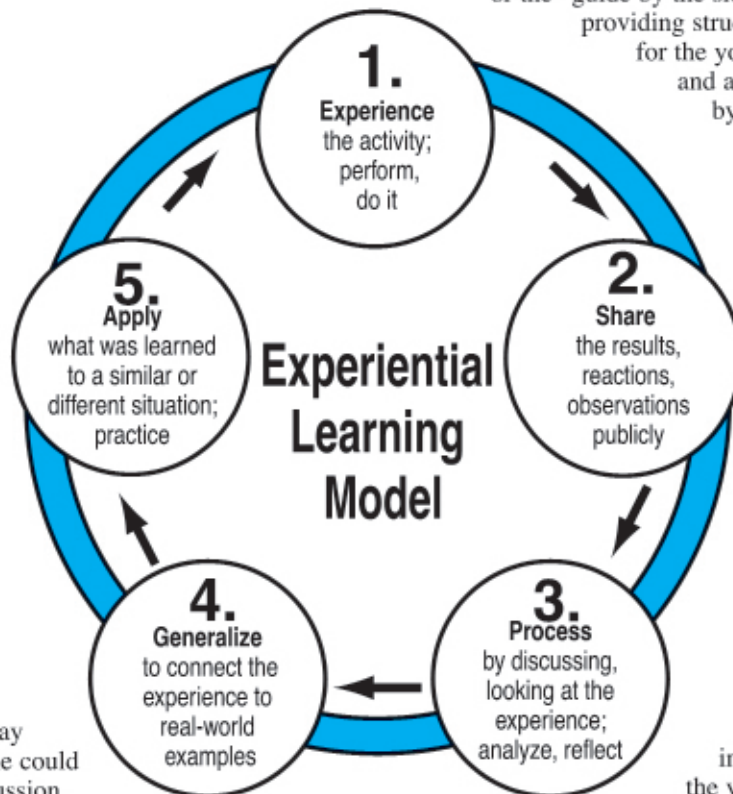
This is the “doing” part of the activity. It immediately focuses the attention to the youth rather than the helper. Encouraging youth to learn by doing before first being told or shown how presents opportunities for life skill development. You act as the facilitator or the “guide by the side” in the experience, providing structure and the environment for the youth to create. You observe and add value to the experience by providing resources, information and asking questions rather than first demonstrating or lecturing.

5. Apply

Youth share how they can use what they learned in other areas. Or they can actually show that they have mastered a skill by performing another activity requiring use of the new skill learned.

4. Generalize

The “Apply” step is a time to talk with the youth. The discussion becomes more personal. So what? Now what? What did the discussion mean to you personally or to your everyday life? The subject matter alone could remain the focus of the discussion, but the Aerospace Adventure activities encourage the process to include life skill development.



Pfeiffer, J.W., & Jones, J.E., "Reference Guide to Handbooks and Annuals" © 1983 John Wiley & Sons, Inc. Reprinted with permission of John Wiley & Sons, Inc.

2. Share

What happened in this experience? What did you do? What did it feel like to do this activity? These are “Reflect” questions to ask the youth. This is the time for the youth to generate information and share their observations with one another. Youth who contribute should feel their contributions are important and valued. Encourage the youth to answer each other’s questions rather than you answering.

3. Process

What was most important about what you did? What did you learn? Common themes that emerge from the sharing discussions are further explored.

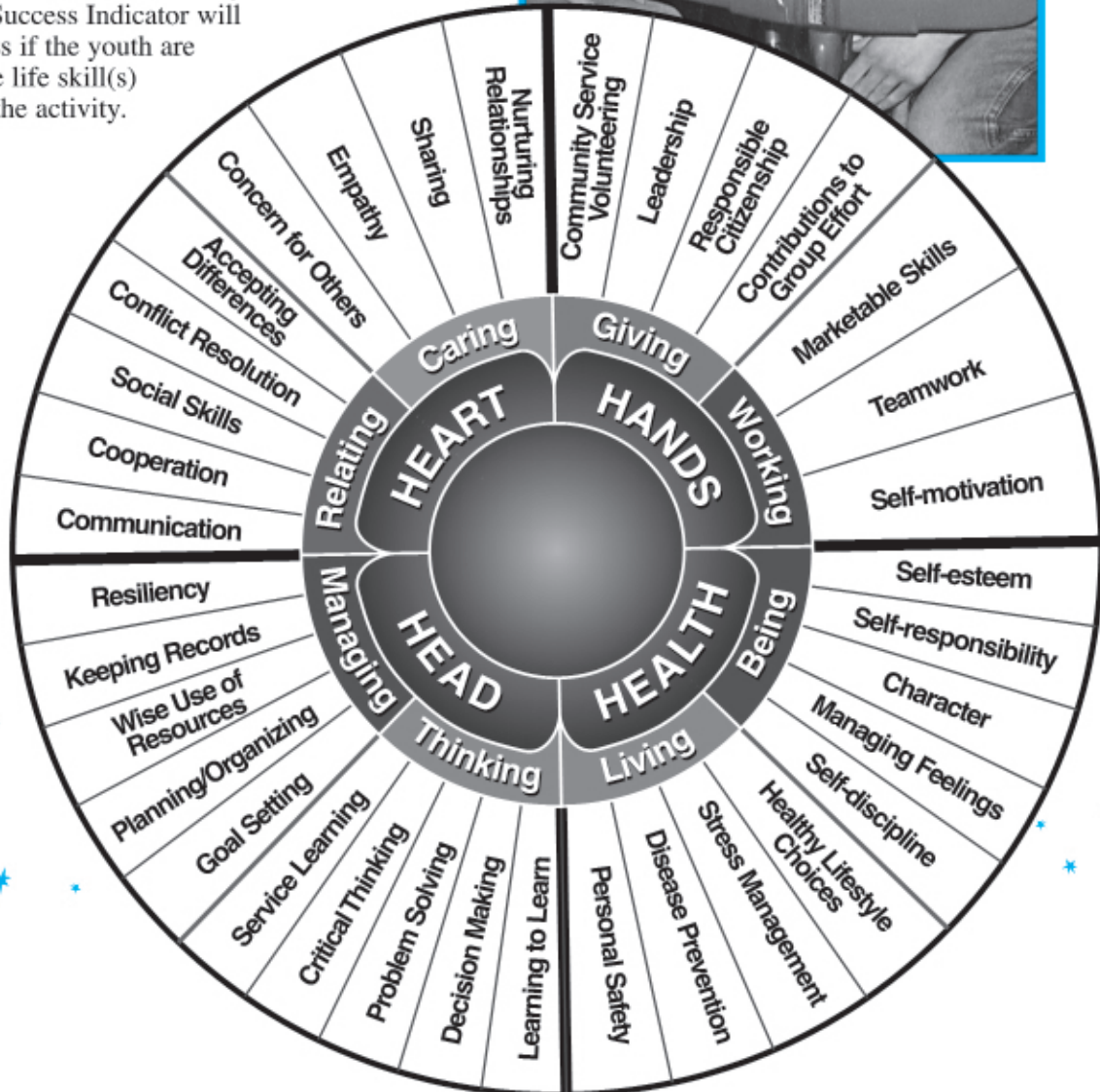
Developing Skills for a Lifetime

The 4-H Aerospace Program focuses on developing skills for a lifetime. A skill is a learned ability to do something well. Life skills are activities that individuals learn which help them to be successful in living a productive and satisfying life. Aerospace Adventures uses the Targeting Life Skills Model and focuses primarily on five life skills in the areas of relating, thinking, being and working.

Using the questions in each activity and checking the Success Indicator will help you assess if the youth are developing the life skill(s) identified for the activity.



Developing life skills while discovering aerospace skills.



Launching Aerospace Meetings

Aerospace project meetings offer exciting settings for youth to develop aerospace and work-related life skills. Clubs and groups that plan their year's program together find that everyone stays more involved and interested each time the group meets. This activity has been designed to help your group make plans that everyone will want to support. You will find activities for involving your group in the planning process. A list of possible meeting topics is found at the end of this guide.

What Group Will Do:

Plan a one-year program of group aerospace activities

Aerospace Skill:

Planning aerospace activities

Life Skill:

Planning and organizing

Target Audience:

K-12

Time:

1 hour

Suggested Group Size:

3 to 20

Materials: Pencil, paper, flip chart or blackboard, poster paper (optional), project achievement programs, literature, resource materials

Briefing

Before the meeting you may want to talk to the parents to see what they feel their children need and how your organization can help. At the meeting, ask the youth and their parents to discuss what they would like to learn and do. Suggest looking through the aerospace activity guides and the list of meeting topics for additional ideas. Your role is to create a situation in which the youth (and their parents) can develop both aerospace and life skills. Helping a group plan a year's program or just one meeting takes a lot of patience and the ability to "sit on one's hands" while the members work together. Here is a technique for generating ideas and arriving at decisions.

Blast Off

Have everyone review the topics in the appropriate aerospace activity guide. Then ask each person to write ideas for group meetings and supporting activities (field trip, tours, community service projects etc.).

Sometimes youth can generate more ideas by working together in groups of two or three, with one person writing down the ideas. Allow five to ten minutes.

Have each person share his/her ideas in round robin fashion. One person or group shares an idea, then the next and so on until all ideas have been recorded on a blackboard or a large sheet of paper. List the ideas quickly without discussion. After all ideas are listed provide time for the person who suggested the idea to clarify or explain it. Others can add support, questions or criticism. After a short discussion, move to the next idea.

From all the ideas generated and discussed (and possibly combined), have each individual rate the items in order of preference on a separate sheet of paper. You may want to have them indicate their top three, or whatever choices. If three choices are indicated, the top choice would receive a three and the last choice a one.

Read each idea and have all members give their rankings. Add up the numbers. Allow time to discuss the choices as they relate to the group's overall goals. From the decisions made, make up the list of topics for the year's program.

Deciding Who Does What: Now that the group has decided what they want to learn more about, you will want to be sure everyone shares in the responsibility of seeing that it happens. Allow as many members (and families) as possible to have a specific job on the year's program. Recreation, demonstrations, refreshments and hosting the main program are all possibilities. If the group is large, the team approach is encouraged.

Completing the Program: Write an outline so everyone can see the plan taking shape. An example of one possible format follows. After the program is completed, make copies for each family. You might include a list of everyone's name and phone number.

Debriefing

Take a few minutes during and after the planning session to talk about the process of planning.

Ground to Ground (Share)

- How did you make the plan for the year?
- How did you feel about our planning session?
- How was everyone involved?

Climb Out (Process)

- Why are decisions made through discussion more often accepted than those made by voting?
- Why is it important for youth, parents and leaders to work together on planning activities?
- What life skills do you practice when planning together?

Level Off (Generalize)

- How does making a plan help you manage your time and your schedules?
- How will this experience help you plan family experiences?
- How will it help you plan in other areas of your life?

Cross Country (Apply)

- How will the way you plan your week or year change as a result of this experience.



Aerospace Meeting Calendar

Name of group _____

Name of helpers/leaders _____

Group goals for the year _____

1. All members complete at least one-half of their achievement program. _____
2. Plan and conduct an airport field day for the community _____
3. Involve each family in activities _____

Meeting Date, Time & Place	Meeting Topic and Planned Activities	Who's Responsibility	What to Do Before Next Meeting
November 6 7 p.m. Vasquez's	Building Rockets	Junior Leaders Carter and Vang Genrick Family	Finish rockets Prepare for launching

Aerospace Quiz Bowl

Need to make your group experiences more exciting? Quiz Bowl is a popular way to involve everyone while they learn about aerospace. The way your bowl will be conducted will depend on the group. To play Quiz Bowl, one team challenges a second team to see which team can respond to the most questions or situations correctly. A question is presented by the moderator and the first team to respond and give the correct response receives points. Quiz Bowl offers youth an opportunity to practice leadership and organizational skills as well as learn about aerospace.

What Youth Will Do:

Plan, conduct and participate in an aerospace quiz bowl

Aerospace Skill:

Testing aerospace knowledge

Life Skill:

Planning and organizing

Target Audience:

Grades 3 to 12

Time:

30 to one hour

Suggested Group Size:

8 to 20

Materials: 30 to 50 aerospace related questions with answers, buzzer equipment (optional), clock, scoreboard

Briefing

Preparation may be minimal or elaborate. Some groups conduct quiz bowls on the spur of the moment, asking each participant to write two or three questions to contribute to the game. Others do a lot of research, outline the questions and answers, make buzzers and build scoreboards. To play you'll need two or more teams of two - four members per team, a moderator to ask questions and indicate who should answer the questions, a judge to indicate correctness of response, a scorekeeper and time keeper. Rotate positions so everyone can be involved and develop important skills.

Blast Off

Work with your planning committee members to prepare for the Bowl. The youth activity guides in the Aerospace Adventures Series can be valuable sources for generating questions. Check the glossaries as well as the activities. The questions can be specifically related to one phase of aerospace or cover several phases. Examples of questions have been included here to start this collection. A computer is a help in organizing the questions. Follow the bowl with a discussion about how the Bowl was conducted and what was learned about aerospace, leadership and teamwork.

The four forces of flight are...

I know...
I know...



Debriefing

Ground to Ground (Share)

- How did you organize the bowl?
- How did you get the questions? Decide on the rules?
- How did you work as a team?

Climb Out (Process)

- What were some of the challenges you faced getting the bowl organized?
- What did you learn about your knowledge of aerospace?

Level Off (Generalize)

- How did organizing this activity compare to other activities you have organized?

Cross Country (Apply)

- What would you do differently next time you organize an activity?



1. Have the group organize and conduct a quiz bowl for another group to introduce aerospace-related ideas and information in a fun way.



AEROSPACE QUIZ BOWL QUESTIONS

Aviation

- Q.** What is a fixed-wing machine driven by a propeller called?
A. Airplane
- Q.** What is the place called where airplanes take off and land?
A. Airport
- Q.** What is a beacon?
A. A light or other signal indicating direction.
- Q.** What is an airplane with two sets of wings, one above the other called?
A. Biplane
- Q.** What part of the aircraft pulls it through the air?
A. Engine - propeller
- Q.** What is the gasoline or kerosene used to run engines called?
A. Fuel
- Q.** What is an airplane without an engine called?
A. Glider or sailplane
- Q.** What is the building called where airplanes are stored?
A. Hangar
- Q.** What kind of aircraft has rotating wings?
A. Helicopter

Space

- Q.** What is a person who operates a space vehicle called?
A. Astronaut
- Q.** What part of a rocket acts like feathers on an arrow to guide it in a flight pattern?
A. Fins
- Q.** What are the four forces of flight called?
A. Lift, weight or gravity, thrust and drag
- Q.** Which of the forces of flight is the opposite of thrust?
A. Drag
- Q.** What force of flight causes an object to be pulled downward?
A. Weight or gravity
- Q.** What is the area on the shuttle's middeck called where food is prepared?
A. Galley
- Hot Air Balloons**
- Q.** What is a long cigar-shaped bag filled with a gas lighter-than-air and powered by an engine called?
A. Dirigible

- Q.** What is a gondola?

- A.** A basket or cabin that hangs beneath a balloon used to hold passengers or equipment.
- Q.** What is a rising body of warm air called?
A. A thermal

Rocketry

- Q.** What is the cylindrical rod called that is used to guide a rocket in its first few feet of flight?
A. Launch Rod
- Q.** What is the purpose of a recovery system in a rocket?
A. To return the rocket to the ground safely by creating drag.

Weather

- Q.** What's a wind called that blows across the path of a kite, aircraft or other object?
A. Crosswind
- Q.** What is a person who studies weather called?
A. Meteorologist
- Q.** What is a windsock?
A. A cone shaped, open-ended cloth that catches the wind and shows wind direction.