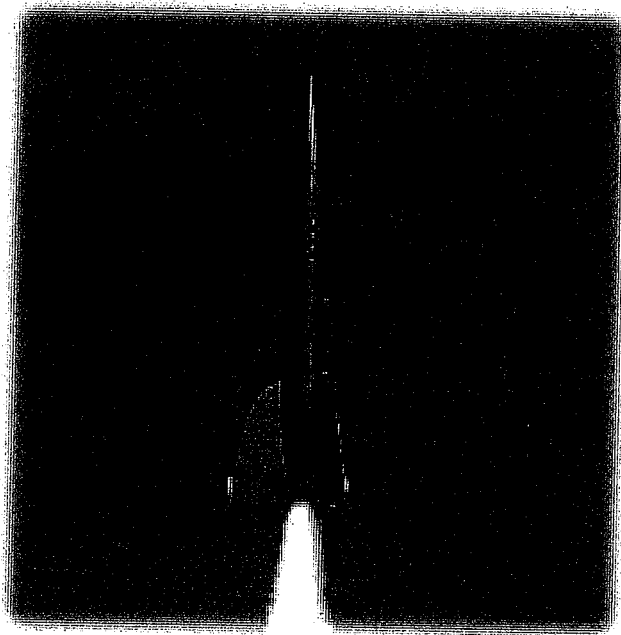


UC
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Aerospace & Rocketry



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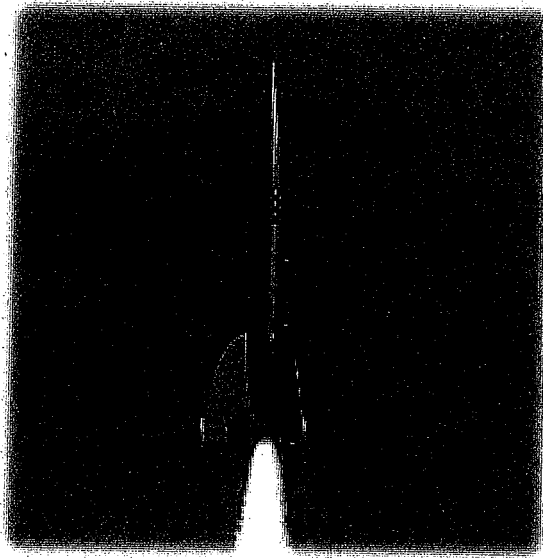
AEROSPACE AND ROCKETRY

BINGO

Find someone who can sign a square acknowledging that they have done that or know the answer

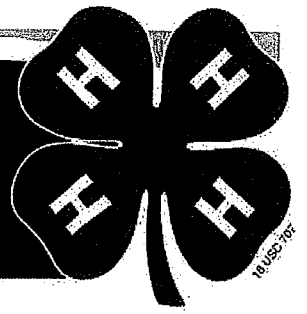
Name one tool used for construction of rocket	Knows someone in the industry	Knows what "lift" is	Knows what "drag" is
Has a model rocket already	Has built a model rocket		

Depending on the size of group, limit the number of times a person can sign on the same sheet

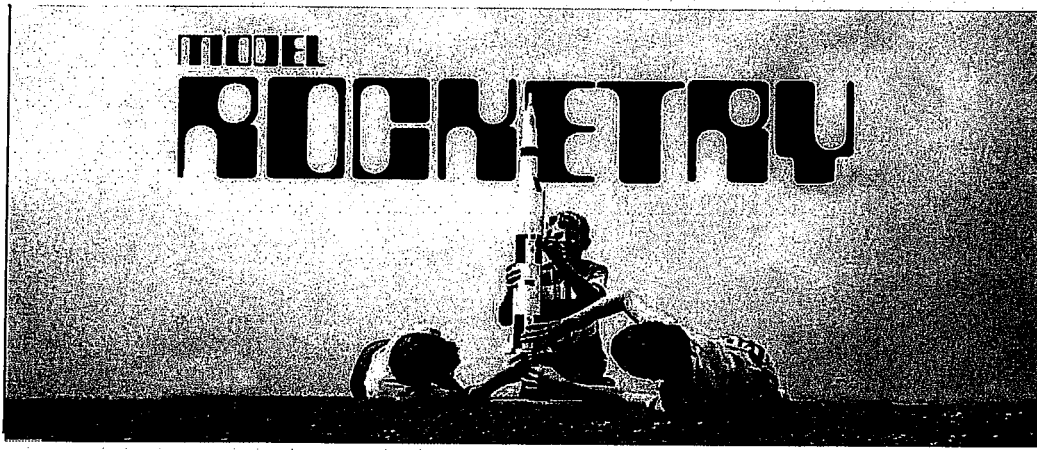


This We Believe:

- The boy and girl are more important than the projects.
- The member should be their own best product.
- No award is worth sacrificing the reputation of a member or leader.
- Competition is a natural human trait and should be recognized as such. It should be given no more emphasis than other fundamentals.
- Learning how to do the project is more important than the project itself.
- Many things are caught rather than taught.
- A blue ribbon member with a red ribbon project is more desirable than a red ribbon member with a blue ribbon project.
- To learn by doing is fundamental in any sound educational program.
- Generally speaking, there is more than one good way of doing most things.
- Every member needs to be noticed, to feel important, to win, and to be praised.
- Our job is to teach members *how* to think, not what to think.



4-H AEROSPACE AND ROCKETRY PROJECT



In this project, youth members will learn about aerospace foundations such as lift, drag, and other interactions from when an object interacts with air by exploring and building rockets. Aerospace and rocketry is a project that can turn anyone on to being a rocket scientist! Knowledge is gained through the construction and flight of model rockets powered by air, water, or solid fuel engines. Participants will be able to learn thorough experimentation.

- What properties of rocket design work and why some configurations work better.
- The safety considerations when dealing with the construction and launching of rockets.
- That science, engineering, and technology education can be a blast!

Starting Out <i>Beginner</i>	Learning More <i>Intermediate</i>	Exploring Depth <i>Advanced</i>
<ul style="list-style-type: none"> ○ Learn how to construct and fly rockets that are powered by air or water. ○ Learn how to safely handle necessary tools for construction and flight. ○ Learn how to build a cold engine rocket from a simple kit. ○ Learn how fins reduce turbulence and help stabilize the rocket during flight. 	<ul style="list-style-type: none"> ○ Learn how to build advanced rocket kits. ○ Learn the proper technique to pack a parachute and flame retardant cloth to prevent damage to the rocket. ○ Learn how lift and drag affect the flight of the rocket and how to increase the efficiency. ○ Learn the process of safely preparing a rocket for launch. 	<ul style="list-style-type: none"> ○ Learn how to build a rocket without a kit from component materials. ○ Learn how to calculate the obtained altitude of the rocket. ○ Be able to teach others about aerospace and prepare presentations to assist. ○ Expose others in the community to aerospace and rocketry with demonstrations.

The activities above are ideas to inspire further project development. This is not a complete list.

4-H THRIVE

Help Youth:

Light Their Spark

A spark is something youth are passionate about; it really fires them up and gives them joy and energy. Help youth find what it is about aerospace and rocketry that excites them.

Flex Their Brain

The brain grows stronger when we try new things and master new skills. Encourage youth effort and persistence to help them reach higher levels of success.

Reach Their Goals

Help youth use the GPS system to achieve their goals.

Goal Selection: Choose one meaningful, realistic and demanding goal.

Pursue Strategies: Create a step-by-step plan to make daily choices that support your goal.

Shift Gears: Change strategies if you're having difficulties reaching your goal. Seek help from others. What are youth going to do when things get in their way?

Reflect

Ask project members how they can use their passion for this project to be more confident, competent and caring. Discuss ways they can use their skills to make a contribution in the community, improve their character or establish connections.

Light Your Spark

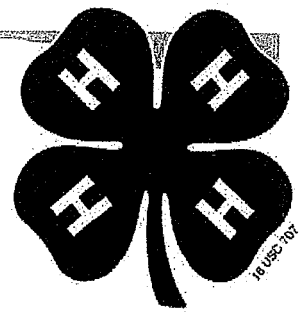
Flex Your Brain

Reach Your Goals

Light Your Spark

Flex Your Brain

Reach Your Goals



Expand Your Experiences!

Science, Engineering, and Technology

- Investigate the concept of aerodynamics and the science behind the flight of the rocket.
- Experiment with differing constructions of rockets to see how flight is affected.
- Use different types launching equipment to see how technology can provide the air/water pressure or electrical current to propel a rocket.

Healthy Living

- Explore the outside landscape surrounding the launch pad for potential safety hazards.
- Make new friends while building and launching rockets with others.
- Race others to see who can retrieve the launched rocket first.
- Research the effects of high altitude on animals and plants.

Citizenship

- Demonstrate the use of model rockets to other youth using skills learned in the project.
- Trace the history and contributions of nations to rocket development.
- Invite youth groups (scouts, high school rocketry clubs) to a "Rocket Jamboree" and share information and best practices.

Leadership

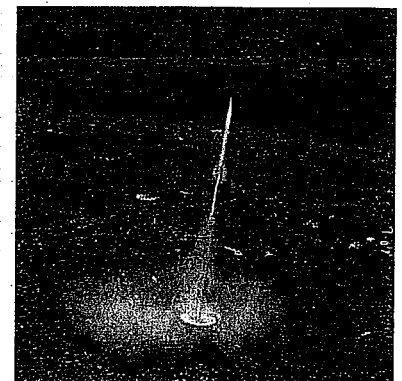
- Teach less experienced members about aerospace and rocketry.
- Become a junior or teen leader.
- Start other Science, Engineering, and Technology projects within the county using Aerospace as a foundation.

Resources

- National Association of Rocketry and 4-H Partnership—Participate in Team America Rocketry Challenge!
www.nar.org/2007/06/4h_and_nar_partnership_announc.php
- Rockets Away, Water Bottle Rockets
[//estore.osu-extension.org/productdetails.cfm?PC=2413](http://estore.osu-extension.org/productdetails.cfm?PC=2413)
- Rockets Away, Solid Fuel Rockets
[//estore.osu-extension.org/index.cfm](http://estore.osu-extension.org/index.cfm)
- Plane Anatomy
www.4-hdirectory.org/browse/browseItemDetails.aspx?itemID=%7B4C64E4B2-5F9A-45A0-8796-3842B66D5FCE%7D
- Balloon Rocket
www.4-hdirectory.org/browse/browseItemDetails.aspx?itemID=%7B778572C2-99D7-45E3-B9CB-8C57704788BE%7D
- Drinking Straw Rocket
www.4-hdirectory.org/browse/browseItemDetails.aspx?itemID=%7B7017CC6D-941C-4E78-8CE7-03809947EC5B%7D

Connections & Events	Curriculum	4-H Record Book
<p>Presentation Days – Share what you've learned with others through a rocketry-related presentation.</p> <p>Field Days – At these events, 4-H members may participate in a variety of contests related to their project area.</p> <p>Contact your county 4-H office to determine additional opportunities available, such as a field day.</p>	<ul style="list-style-type: none"> • National 4-H curriculum - www.4-hdirectory.org/Product/4-hcurriculum.aspx?space=74431 • Paper Helicopter - www.4-hdirectory.org/browse/browseItemDetails.aspx?itemID=%7B704D161B-2E24-4C6A-8229-773B2BD151D9%7D • Paper Airplanes - www.4-hdirectory.org/browse/browseItemDetails.aspx?itemID=%7B537532A6-3E54-422E-9A3E-BBDC0F7EAG1B%7D 	<p>4-H Record Books give members an opportunity to record events and reflect on their experiences. For each project, members document their personal experiences, learning and development.</p> <p>4-H Record Books also teach members record management skills and encourage them to set goals and develop a plan to meet those goals.</p> <p>To access the 4-H Record Book online, visit www.ca4h.org/4hbook</p>

The UC 4-H Youth Development Program does not endorse, warrant, or otherwise take responsibility for the contents of unofficial sites.



University of California Agriculture and Natural Resources



I'm a 4-H Project Leader: Now What Do I Do?

How do I know who is in my project?

- Your club organizational leader will provide you with the names, addresses and phone numbers of the members enrolled in the project for which you are the leader.
- If you are working on the county level, contact the UCCE for the list of project members.
- The organizational leader may indicate to you if any of the youth have special needs. At your first project meeting, note any other youth that may have special needs.
- You may wish to consult with the parent or your 4-H Youth Development Agent as to how to work with a special needs child.

How often should I hold project meetings?

It is recommended you hold 4-6 meetings that each last 1½ to 2 hours in length. Some projects require more meetings or a longer meeting time to accomplish your goals. Some projects, such as leathercraft, may lend themselves to individual project work as members progress on their projects. In this case, you should hold several introductory meetings for all members and then set up a schedule of time for them to sign up for individual help.

When do I start?

Get started as soon as possible! Members' interest in a project is most keen when they are signing up for a project and when they get their project books.

How do I cover the cost of project meetings?

- There is a wide variety of means for covering the cost of project meetings. Some methods used include:
 - Each member pays for their share of the expenses or provides a portion of the supplies.
 - The club agrees to cover expenses using funds from their treasury. Approval in advance is needed for this.
 - Members and leaders can solicit donations/supplies from area businesses.
 - Sometimes funds from sources outside your club may be available to cover your project meeting costs.

How do I establish a project meeting schedule?

First, determine when you are available to work with project members. Then determine an initial project meeting date by consulting with your project members.

How can I incorporate activities not included in the project guide?

We encourage you to use the ideas in the project literature as they have been successfully used with youth. If you have some additional activities you would like to incorporate, consider the following criteria:

- Of interest to kids
- Developmentally appropriate
- Incorporate the experiential learning model
- Youth and adults are involved in determining what will be done
- Enhances the development of member life and project skills
- Research based source of content utilized

What is the relationship between project work and the county fair?

The County Fair is an opportunity for an independent evaluation of life and project skills a member learned through completing a project. County fair entries typically match the activities included in the project literature and may include other activities that are being emphasized in your county. One of your roles is to help maintain the focus of members and parents on the goal of 4-H, which is to develop blue ribbon kids. Talk with members about what they learned about each of their fair entries from the judging process. Help members celebrate their accomplishments regardless of the color of ribbon each project member received at the fair. This may be done through individual encouragement or at a meeting following the fair. While entering and displaying a project at the County Fair is the traditional method of public affirmation, there may be other means of exhibition such as a club tour, open house, community celebrations or others.

Who can I go to if I need someone to help me during the project meetings?

If you are leading beginning level project meetings, ask older members in the project to help you. This is a great leadership experience for them! Parents are another excellent source of help. Don't hesitate to ask them to stay for the meeting and be actively involved in their child's project work.

Publicize the date using one of the following means:

- County and/or club newsletter
- Club meeting or leader association meetings
- Postcards or phone calls to project members

You may not be able to schedule an initial meeting that everyone can attend. Establish a time to meet with those unable to attend before you hold your second project meeting.

Where do I hold project meetings?

Typically project meetings are held at project leader homes, schools, or community buildings. For more information on facility adaptability and liability concerns contact your 4-H Youth Development Agent.

What safety precautions do we need to consider?

Consider the type of safety issues your particular project involves. Request and secure necessary safety items such as ear protection, eye protection and head protection.

How do I let others in my club or other clubs know I am a project leader?

Prior to enrollment ask for time on your club's meeting agenda to let families in your club know you're a project leader and to share some things the kids could do in the project if they enrolled in it. When the project materials are handed out, take the opportunity to inform or remind members that you are their project leader and set an initial meeting date with the group. If no one in your club is in your project, you may wish to offer your services to a neighboring club. Talk to your club organizational leader or county 4-H Youth Development agent about this opportunity.

How do I prepare for the first meeting?

You may want to establish a 4-H resource box where you keep your project materials and any additional resources you will be using. Take time to become familiar with your project literature and talk to others who were project leaders for this project to find out what activities the members enjoyed.

What should I do at the initial project meeting?

- At the initial project meeting, here are some ideas of what you might want to cover:
- Find out what the members want to learn and accomplish in the project. The project literature is an excellent source of ideas.
- Review the safety practices that members will need to follow.

- Do an introductory activity related to the project so the members get to know one another
- Have a small project the members can complete and take home
- Talk about how the project meeting supplies will be paid for. Experienced leaders have found it easiest to charge a small fee to cover the cost of the expenses.
- Assess when members are available for additional meetings. You may wish to ask the parents or members to bring along their calendars of family activities.
- Encourage parents to participate in project meetings, especially the initial meeting.

What does a typical project meeting look like after the initial orientation?

Use the experiential learning model (found in the introductory pages of your Helper's Guide) to plan your project meeting. The project helper's guide will provide suggestions for designing a project meeting. Here are some suggestions for each section of the model:

Do

- Plan an activity to focus the project members on what they'll be doing today. Work on the project for that meeting.

Reflect

- Review the process completed
- Discuss what worked and didn't work.
- Talk about how any problems that arose were solved.
- Assist members in documenting their project work for inclusion in their record books/portfolios.

Apply

- Ask the project member the following questions:
- What else have you seen that is similar to this?
- How can you apply what you learned today to other situations?

What resources are available to help me?

- 4-H Project Literature – You will receive project literature through your 4-H club or the UW-Extension office. Typically there is a helper's guide and member literature for three to four levels.
- Other People in my Club & County – There are a number of people in your county who would be willing to share project ideas and tips with you.

These include:

- Project leaders in other clubs
 - County Staff
 - Older youth who have been involved in the project
-
- **Media Collection & Public Libraries** – Additional resources can be obtained from the Cooperative Extension Media Collection. They have videos, skillathons, displays and resource packages available to support a variety of projects. There is a user fee per item you or your club will be responsible for. You can view their catalog at their website <http://www.uwex.edu/ces/media/>. Check with your local public library to find out what resources they may have or that you can obtain through inter-library loan.
 - **4-H Website** – Wisconsin 4-H is continually adding more information and activities to their website. Visit this site at www.uwex.edu/ces/4h/onlinepro/. You may wish to check out websites from other state 4-H programs also.
 - **Volunteer Leaders Conferences** – Review each issue of your county's newsletter to learn about training sessions for project leaders offered by your county, district or at statewide events. Sessions focusing on new project literature are typically offered at the State 4-H Volunteer Leader Conference held every other year. Periodically statewide conferences focusing on specific project areas are offered in addition to sessions at the volunteer conferences. You can also exchange ideas with other leaders at statewide Field Day.
 - **Field Trips** – Youth always enjoy the opportunity to see firsthand how things are done and how they work. Consider taking your project group on a field trip or tour of a local business or company to enhance their project experience. An example would be taking your dairy members to a cheese factory or your foods group to a local bakery.
 - **Local Experts** – Bring in a local "expert" to share their ideas and experiences with your group. One example would be asking a Master Gardener to share information on choosing perennial or trimming shrubs at one of your project meetings.
 - **Magazines** – Many leaders have found creative ideas to supplement those in the project literature in magazines they have or those at the public library.

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Aerospace Ideas

<https://www.extension.iastate.edu/4h/projects/aerospace>

NASA has lots of info for all ages:

https://www.nasa.gov/audience/forstudents/k-4/finditfast/K-8_Alpha_Index.html