

Science, Engineering and Technology

4-H Aerospace

North Dakota 4-H Project Sheet

This 4-H project is designed to help you explore the world of aerospace, from learning about rocket parts and how they fly to building a rocket and demonstrating to others what you have



Pass it on! Now that you know how, share it with others. Here are ideas to get you started.

Communication

- Prepare and give a speech about a model rocket exhibit at a science fair, club or achievement days.
- Demonstrate glider flight capabilities.
- Interview a pilot.

Here's what you can do all year!

Stage 1 Pre-Flight Grades 1-3

Build a rocket

and identify

rocket parts.

airplanes.

aerospace

· Design and make

a spacecraft.

careers.

Identify

Learn how birds

and airplanes fly;

compare birds to

Stage 2 Lift-Off Grades 3-5

• Make and read a

Identify types of

map.

aircraft.

Reaching New Heights

Stage 3

Grades 6-8

Stage 4 Pilot in

- Make a paper
- Discover how weather affects flying.
- Understand the "angle of attack."
- Identify parts of a hot-air balloon and make a hotair balloon.
- Learn and use the International Phonetic Alphabet.
- Discover the effects of disorientation in space.

- Build a straw and balloon rocket.
- flight simulator.
- Make a flying wing glider.
- Build a controllable glider.
- Build a Nagasaki Hata Fighter kite.
- Discover basic helicopter functions and parts.
- Make a hang glider.

Command Grades 9-12

- Build a Viking rocket.
- Construct and use an altitude tracker.
- Research how to qualify for a pilot's certificate.
- Plan and teach an aerospace session.
- Evaluate and design navigation systems.
- Build a flat-style box kite.
- Complete a career profile.

Citizenship

- Organize a rocket launch.
- Organize a kite-flying contest.
- Volunteer at a local airport or airshow.

Leadership

- Organize an airport tour for your 4-H club.
- Conduct an aerospace skillathon.
- Teach a workshop on aerospace.

Entrepreneurship

- Build and sell kites.
- Organize a kite flight contest.
- Teach a class on model rocketry, kite building and model airplane flying.
- Open a small retail operation to sell airplane, kite and rocket kits.



EXTENSION

Learn more at www.ndsu.edu/4h or contact your county NDSU Extension office.



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Opportunities to explore aerospace:

- Explore an aerospace career using online resources.
- Shadow an airline employee for one day.
- Attend an aerospace event or camp.
- Visit a local airport and have a pilot and/or mechanic talk about flying.
- Look for opportunities to take the ground school portion of a flight training class.
- Visit with an aircraft maintenance engineer to learn about aircraft maintenance.
- Take a flight with a flight instructor.



Exhibit Ideas

- Build model rockets from a kit.
- Build model rocket from your own design.
- Build a model airplane from a kit or your own design.
- Create a display of aviation principles.
- Create a display of in-flight procedures.
- Create a poster with pictures of places you've visited, your first plane ride, programs you've participated in, types of planes, etc.
- Develop a booklet on specific types of planes; knowledge of how planes/rockets work.
- Do a report (could include interviews with people) on the history of space flight; history of space exploration or astronauts; careers; aerospace related to agriculture; how planes or rockets work; principles of flight or military air battles.
- Write a story about aerospace or space flights, rockets, etc. (can be science fiction).
- Create a booklet on specific types of planes; knowledge of how planes/rockets work.
- Build any other model (helicopter, etc.).

4-H Resources

National 4-H Curriculum Books

- Pre-Flight (HCA131)
- Lift-Off (HCA132)
- Reaching New Heights (HCA133)
- Pilot in Command (HCA134)
- Flight Crew Helper's Guide (HCA231)
- Educational Trunk
- Aerospace Event
- National Youth Science
 Day

Other Resources

- UND Aerospace
 Paging of Paging
- Basics of Rocketry (Educators area of NASA website)
- <u>National Association of</u> Rocketry
- NASA Science
- NASA Kids Club
- NASA Education for Students
- NASA Education for Educators

Recordkeeping

- Planning for My Project Adventure (PA093) (Ages 8-10)
- 4-H Project Plan (PA095)
- 4-H Plan of Action (PA096) (Ages 11-18)
- ND 4-H Participation Summary for 11- to 19year-olds (PA098)

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