



ROCKETRY

WELCOME

Welcome to the 4-H Rocketry Project! Please read through this guide carefully, as it contains information and suggestions that are important for your project. **4-H leaders can obtain a Leader Project Guide and other resources from the PEI 4-H Office.** Hopefully you, as a member, will “Learn to do by Doing” through hands-on activities that will encourage learning and enjoyment. If you have any questions, contact your District 4-H Officer or your 4-H project leader.

4-H YEAR COMPLETION

You complete a project by:

- completing the project Achievement Day requirements
- completing a communication project
- completing a community project
- completing an agriculture awareness project
- taking part in Achievement Day

You must complete all of the listed aspects in order to show at Fairs and Exhibitions.



ACHIEVEMENT DAY REQUIREMENTS	
Styro Glider	10
Straw Flyer	10
Maple Seed Flyer	10
Rocket	70
	100 Marks

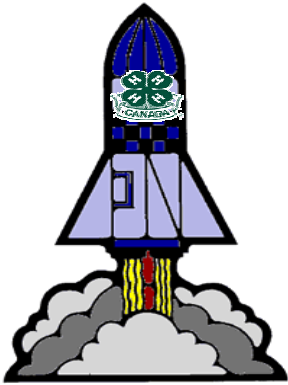
EXHIBITION REQUIREMENT
Rocket

In this project, you will examine, through a hands-on approach, the progression in understanding the four basic forces that affect flight to the making and launching of homebuilt rockets. The project meetings are designed to engage you in the discovery process. It is important you understand that you can learn just as much from your mistakes as from your success in the design process.



Ages for 4-H members as of January 1st of the 4-H year:
 Junior: 9-11 years
 Intermediate: 12-14 years
 Senior: 15-21 years

Check out the PEI 4-H Web Site
www.pei4h.pe.ca



REMEMBER...

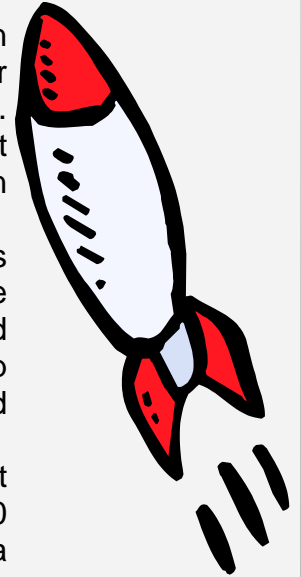
Three devices are needed to fire and track the rockets you launch. They are a launch pad/safety flag; a control panel; and a tracking scope. These items are for sale from leading model rocket manufacturing companies, but you may prefer to build your own.

Building Your Model Rocket

There are many model rocket styles to choose from. Your leader can help you choose one. Most kits have a good set of easy-to-understand instructions. *Follow them.*

Here are a few additional pointers:

- Before you cut your fins, be sure the grain of the wood is going the right way. Your instructions will tell you which way is right. Then sand the front edge to make it rounded and sand the trailing edge of the fin to a sharp point.
- Take a root edge of a fin (the root edge is the edge that goes onto fuselage) and place it in a pool of glue. Put it on the rocket and hold it for 15 seconds. Take off and dip again. Hold the fin with root edge attached to the rocket until glue is stable.
- When painting your model, remember that the glossy smooth rocket will go about 60 percent higher than the same rocket given a rough paint job. Some people even put a coat of wax on their rockets after they are painted and dry to make the surface even smoother.



The main thing in assembling your kit is to take your time and follow instructions.

BE A GOOD SPORT!

In the spirit of learn to do by doing, all those involved in 4-H are encouraged to practice good sportsmanship, use common sense at all 4-H activities and the work in any 4-H project should be the member's own work.

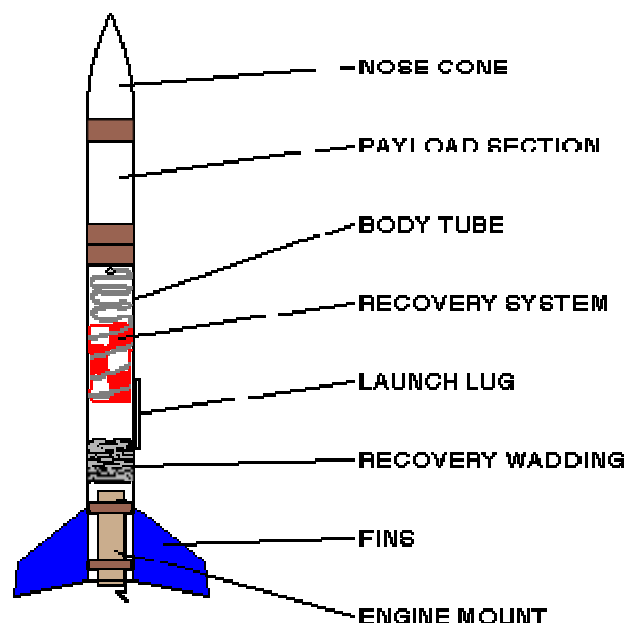
HELPFUL RESOURCES!

- www.greathobbies.com/rockets
- www.calgaryrocketry.org
- www.nar.org
- www.canadianrocketry.org
- www.coastrocketry.com



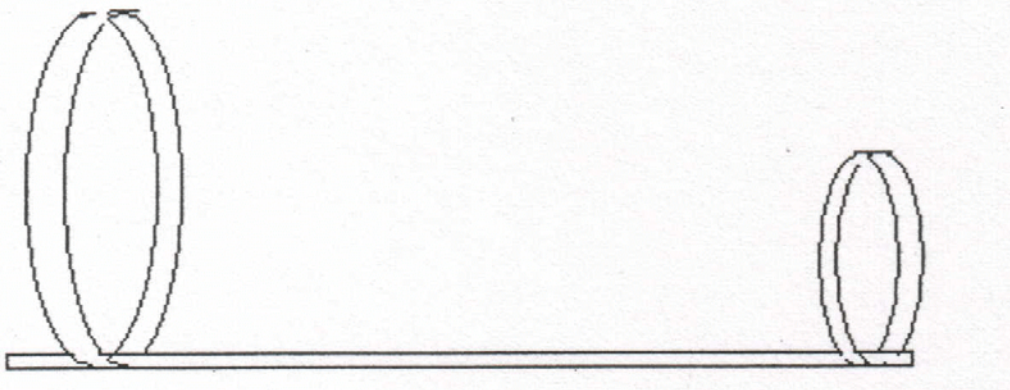
A variety of books are available at the PEI 4-H Office which can be borrowed for a two week loan period. To book these, call 368-4833 or drop by the PEI 4-H Office at 40 Enman Crescent, Charlottetown.

PARTS OF A MODEL ROCKET



Straw Flyer

Use the diagram below to help you make a straw flyer.



Essentially, the straw flyer is a small loop of paper at the front of a straw and a larger loop of paper at the rear of the straw. Both loops should be pointing up when you throw it. You should also throw it with a smooth forward motion, much like throwing a dart. Make sure that the small loop is facing forward. The difference in sizes of the loops, as well as their closeness to each other, has an effect on its flight.

Throw your straw flyer. Can you guess what the effect would be of changing the loop size, position, etc.?

Try to discover which straw flyer will fly the farthest straight distance (harder than it seems).

Maple Seed Flyer

If you have a maple seed available, hold it high and drop it. Watch as it spirals downward. Why did it spiral instead of just dropping like a ball? Could it be because of wing shape?

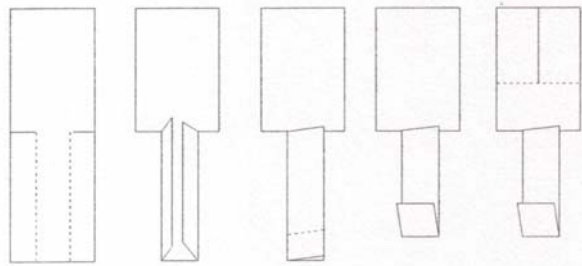
If you don't have a maple seed available, you will want to make a Maple Seed Flyer for this activity. To make one, use the pattern at the end of this section.

Once you have made one, attach the paperclip to the bottom, fold out the "wings" each in a different direction, and let it drop. It should windmill down in the same way that the maple seed would drop. Why did the Maple Seed Flyer spiral instead of just dropping like a ball? Again, could it be because of wing shape?

Make your own Maple Seed Flyer and experiment with wing length.

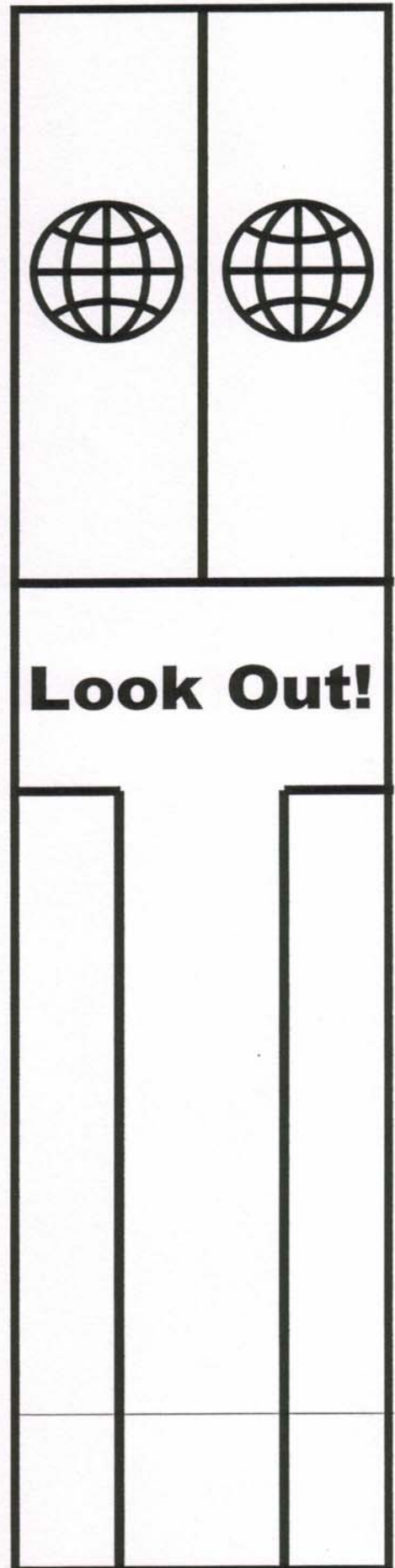
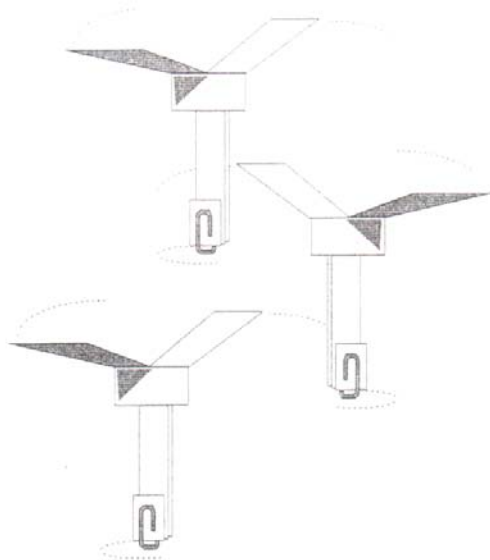
You can try this several times, experimenting with wing length. You can also try bending the wings of their flyers in different directions. Does the Flyer now spin differently? Why? Note the fold in the paper, as well as the wing shape that is produced when the Flyer falls. Can you make the connection between the shape of the Flyer wing and wing shape learned in the previous lesson? If not, don't worry. The Flyer has two wings, and it spirals because lift on the wings turns the Flyer around and around.

Maple Seed Flyer ... Instructions



The Plane:

- Cut on the two middle horizontal lines, and fold in.
- Fold the bottom flap up.
- Cut the vertical line at the top and fold paper in opposite directions to create two flaps.
- For best results, attach a paper clip to the bottom.
- Drop and watch it spin!



Community and Agriculture Awareness Projects

COMMUNITY PROJECT

Each year you are encouraged to provide a service to your community as a 4-H member. This introduces you to the responsibilities of citizenship. You must participate in your club's plan for a community project and you should have a role to play. Describe your involvement with your club's community project this year.



Our Community Project was _____

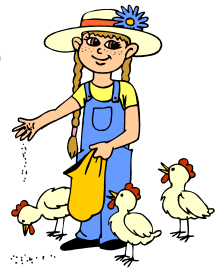
I helped by _____

It was beneficial because _____

I learned _____

AGRICULTURE AWARENESS PROJECT

Agriculture is one of PEI's main industries. You are expected to participate with your club to complete a project (or provide a service) which helps your club or others become aware of the importance of agriculture in our lives. As in the community project, you should actively participate.



Our Agricultural Awareness Project was _____

I helped by _____

It was beneficial because _____

I learned _____