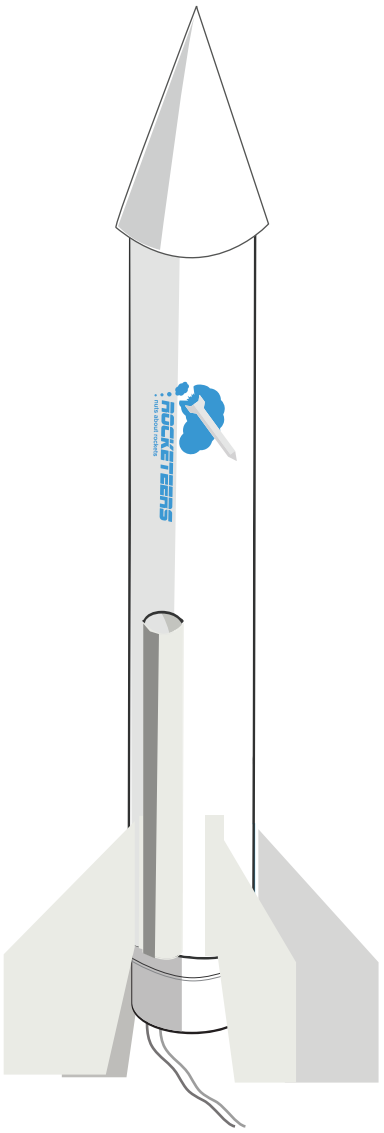
ROCKETEERS
nuts about rockets

Instruction manual



This instruction manual comes with the rocket kit.

The contents of the kit are:

- Rocket 101 Template Sheets (3)
- Dowel for body tube (1)
- Rocket Adhesive (50 grams)
- Rope (For Swing test)
- Sandpaper
- Scissors
- Instruction Manual cum A1 Poster
- Plastic Show Fins (4)
- Vanity Booklet
- Igniter Assembly Components

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SAFETY INSTRUCTIONS:

As per the international laws and safety instructions, a model rocketeer has to mandatorily follow the instructions below.

a. **Materials.** I will use only lightweight, non-metal parts for the nose, body, and fins of my rocket.

b. **Motors.** I will use only certified, commercially-made model rocket motors, and will not tamper with these motors or use them for any purposes except those recommended by the manufacturer.

c. **Ignition System.** I will launch my rockets with an electrical launch system and electrical motor igniters. My launch system will have a safety interlock in series with the launch switch, and will use a launch switch that returns to the "off" position when released.

d. **Misfires.** If my rocket does not launch when I press the button of my electrical launch system, I will remove the launcher's safety interlock or disconnect its battery, and will wait 60 seconds after the last launch attempt before allowing anyone to approach the rocket.

e. **Launch Safety.** I will use a countdown before launch, and will ensure that everyone is paying attention and maintain a safe distance of at least 15 metres away when I launch rockets with the motors supplied by the manufacturer. If I am uncertain about the safety or stability of an untested rocket, I will check the stability before flight and will fly it only after warning spectators and clearing them away to a safe distance.

f. **Launcher.** I will launch my rocket from a launch rod, tower, or rail that is pointed to within 30 degrees of the vertical to ensure that the rocket flies nearly straight up, and I will use a blast deflector to prevent the motor's exhaust from hitting the ground. To prevent accidental eye injury, I will place launchers so that the end of the launch rod is above eye level or will cap the end of the rod when it is not in use.

g. **Flight Safety.** I will not launch my rocket at targets, into clouds, or near airplanes, and will not put any flammable or explosive payload in my rocket.

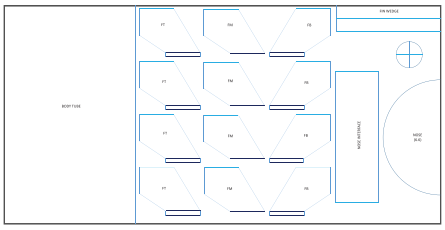
h. **Launch Site.** I will launch my rocket outdoors, in an open area at least as large as specified and in safe weather conditions with wind speeds no greater than 20 km per hour. I will ensure that there is no dry grass close to the launch pad, and that the launch site does not present risk of grass fires.

i. **Recovery System.** I will try to use a recovery system such as a streamer or a parachute in my rocket and to support it, I will use only flame-resistant or fireproof recovery system wadding in my rocket.

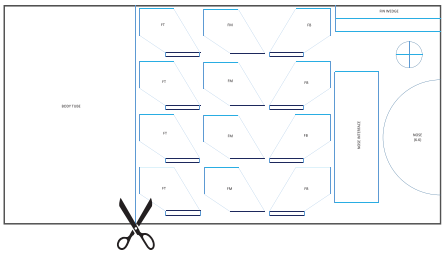
j. **Recovery Safety.** I will not attempt to recover my rocket from power lines, tall trees, or other dangerous places.

Body Tube

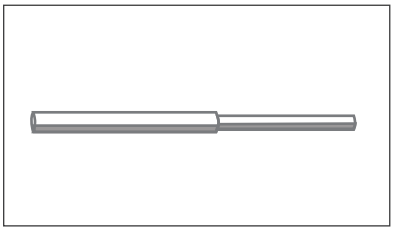
1. Take the rocket sheet out of the kit



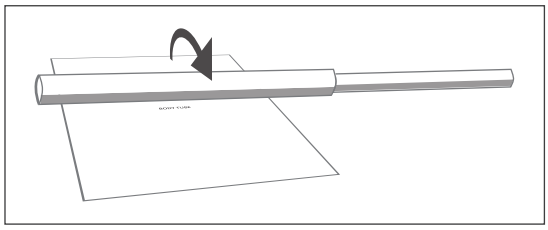
2. Cut the image for the body tube.



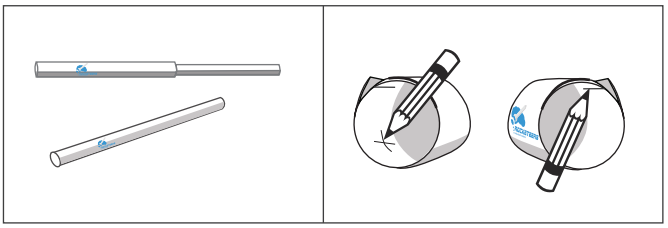
3. Take the dowel out of the kit



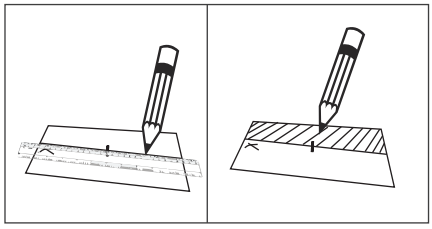
4. Fold the body tube along the lateral direction as shown. Wrap the body tube sheet tight on to the dowel



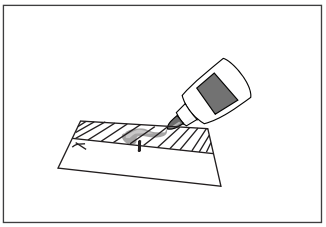
5. Remove the folded paper sheet as shown, and mark a line both sides to apply adhesive. Place a cross



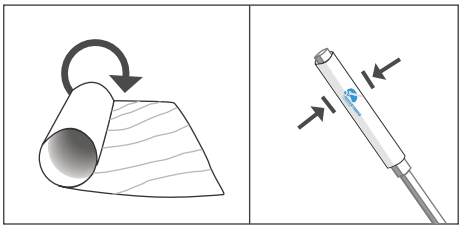
6. Take a scale and draw a line connecting the two lines. Shade the uncrossed portion.



7. Apply fevicol on to the shaded portion.



8. Fold it to the rim of the adhesive and make the body tube by rolling the paper completely.

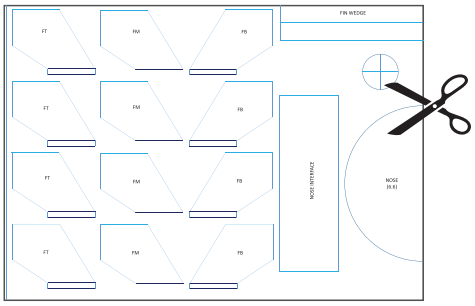


9. Put it on the dowel and press it firmly.

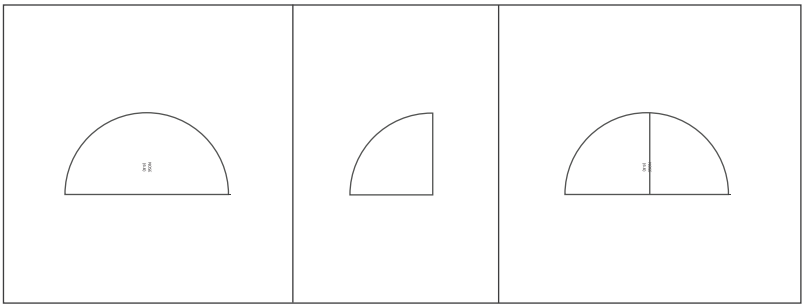
10. Take it out and the ody tube is ready.

Nose Cone

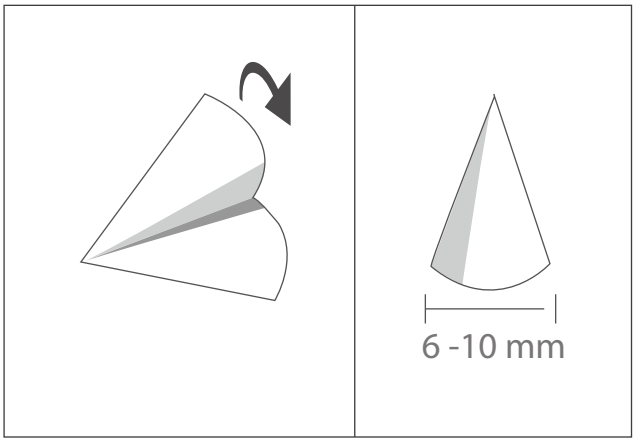
1. Take the rocket sheet and cut out the semi-circular nose cone portion.



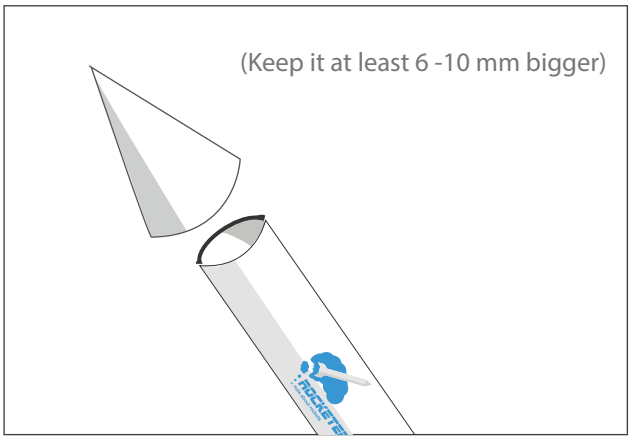
2. Mark the centre by folding the edges.



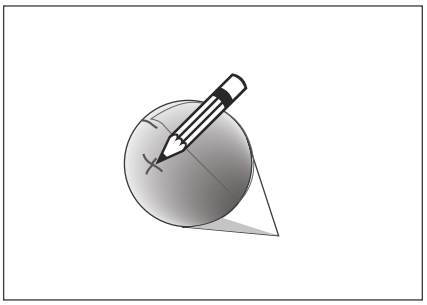
3. Fold the semi-circular nose cone paper into a cone as show by the images



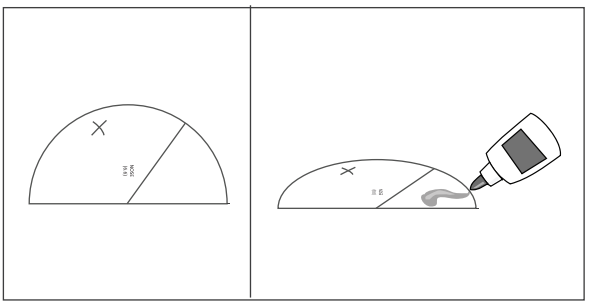
4. Ensure that the nose cone diameter is bigger than the body tube.



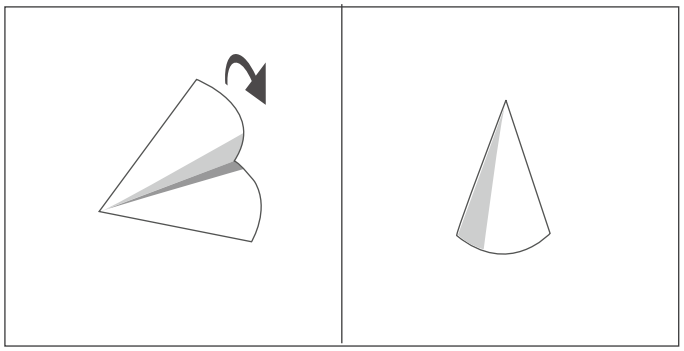
5. Mark the adhesive line, place a cross



6. Extend the line to the centre of the semi-circle. Apply adhesive on the uncrossed portion.

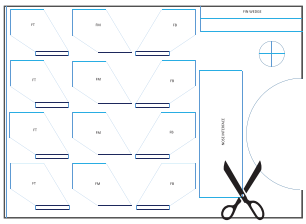


7. Fold the nose cone appropriately, and the nose cone is ready!

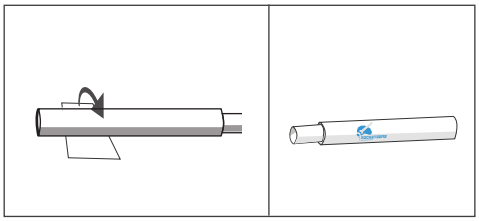


Nose Cylinder

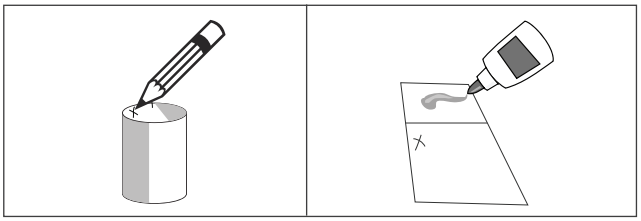
1. Cut out the portion for nose cylinder.



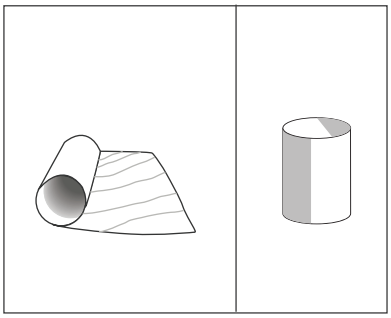
2. Fold it on the dowel and correct it to fit inside the body tube.



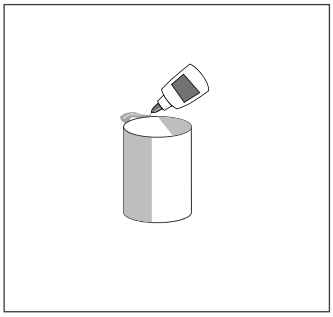
3. Draw a line and put the cross as shown, apply adhesive on the uncrossed portion.



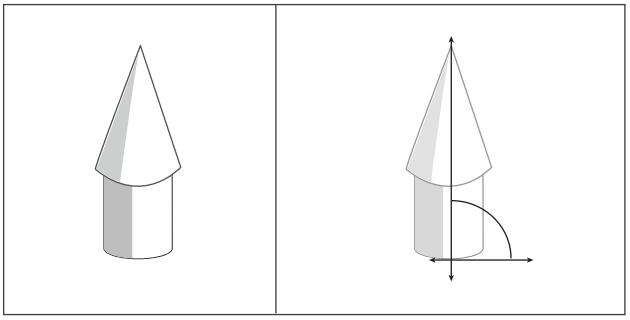
4. Fold to make the cylinder.
Cylinder is ready!



5. Take the upper rim of the cylinder and apply adhesive.

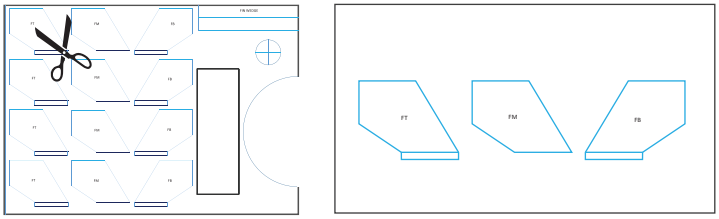


6. Insert the nose cylinder into the nose cone and fix it perpendicularly. Ensure the alignment is straight.

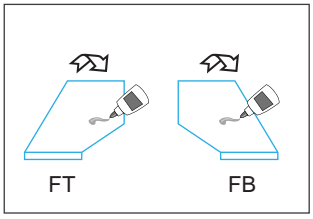


Fins

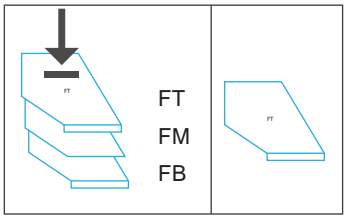
1. Cut the fin top (FT) piece from the rocket sheet. Similarly cut the fin middle (FM), fin bottom (FB), fin pieces from the rocket sheet.



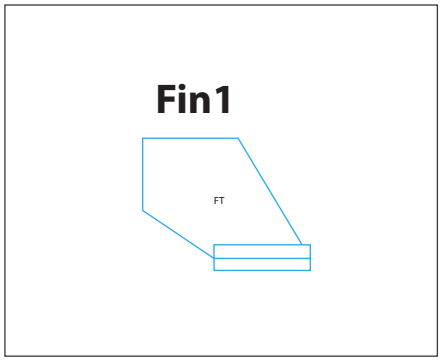
2. ake the fin bottom side and apply adhesive on the rough side.



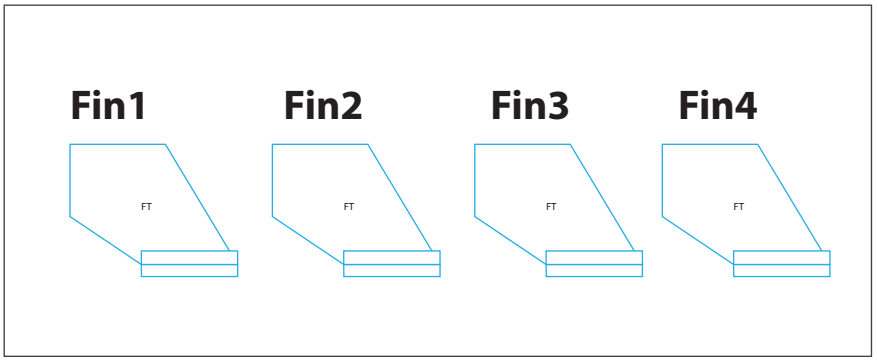
3. Stick the FM piece as per the shape
4. Apply adhesive on the FM top, and stick FT rough side above the FM.



5. Make the edges perpendicular.
Now fin1 is ready.

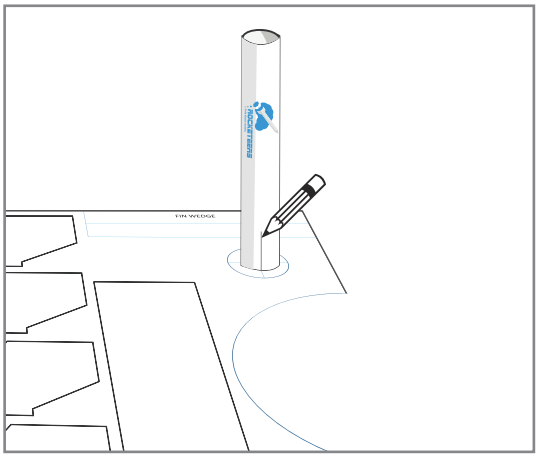


6. Repeat the procedure for Fins 2, 3 and 4.

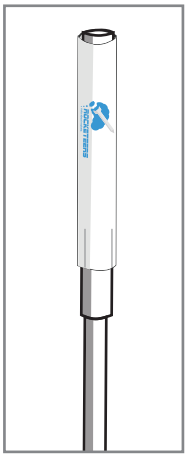


Assembly operations

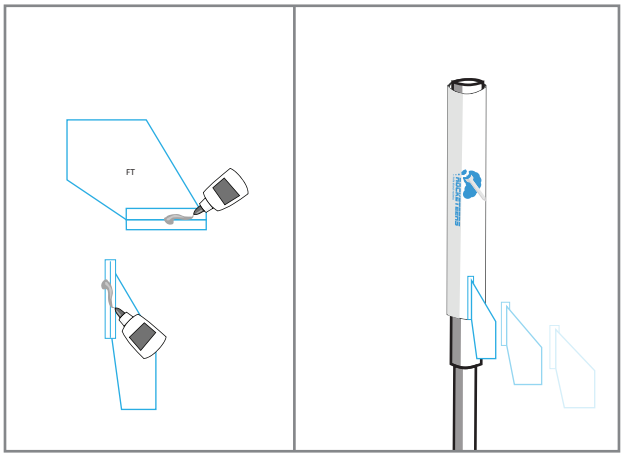
1. Put the body tube on the wire mesh in the rocket sheet.
2. From the perpendicular lines given, draw vertical lines on the body tube on all four sides for the four fins.



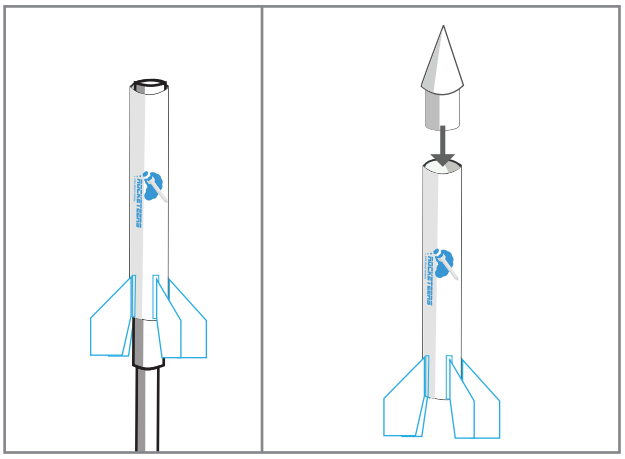
3. Take the body tube and insert it into the dowel.



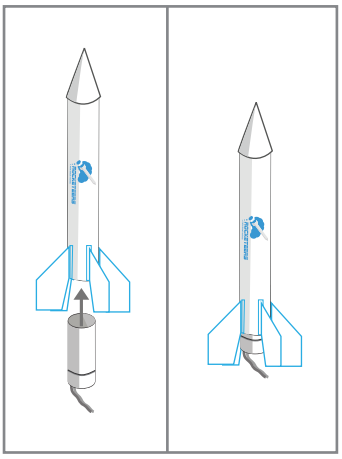
4. Put adhesive on the outer ridge of the fin as shown in the figure. Stick it as shown in the figure. Ensure the alignment of the fin is straight to the body tube.



5. Repeat the steps to stick all the other three fins.
6. Put the nose cone inside the body tube.

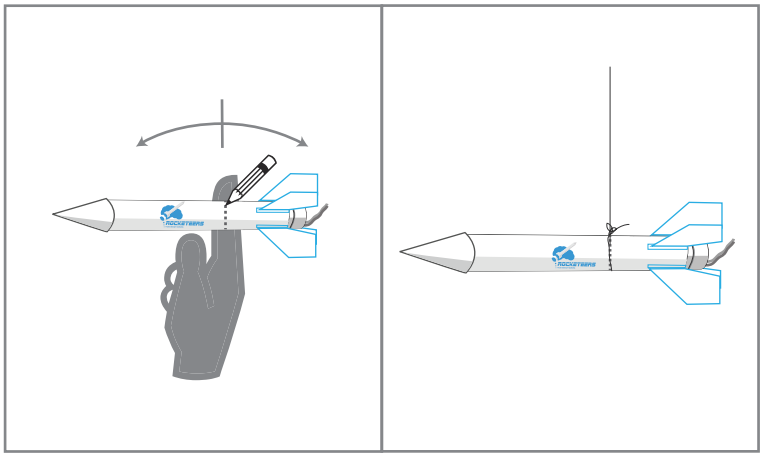


7. Ensure tight fit of the motor, apply adhesive to outer edges of it, and then insert the motor into the body tube.

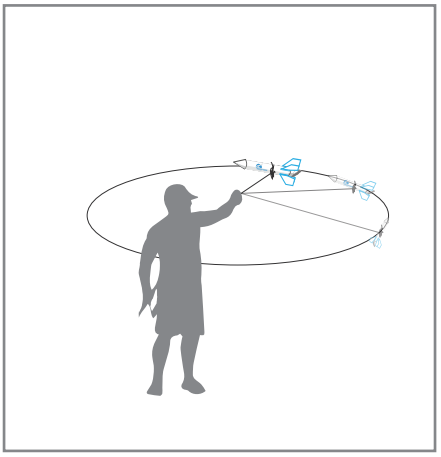


8. To get the rocket ready for the launch, one needs to do the testing and prepare the launch lug.

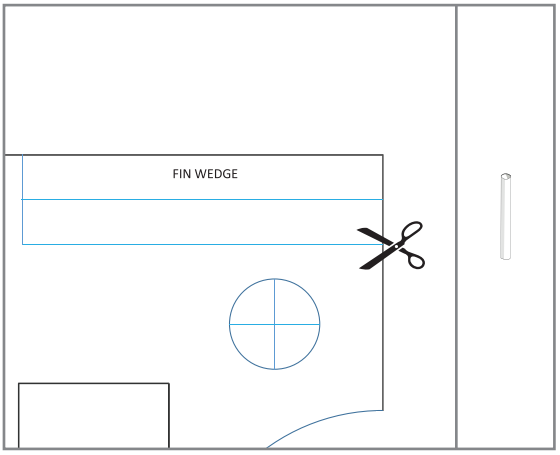
9. Determine the centre of gravity of the rocket by balancing it on your finger and mark it with a pencil. Tie a thread at the centre of gravity of the rocket.



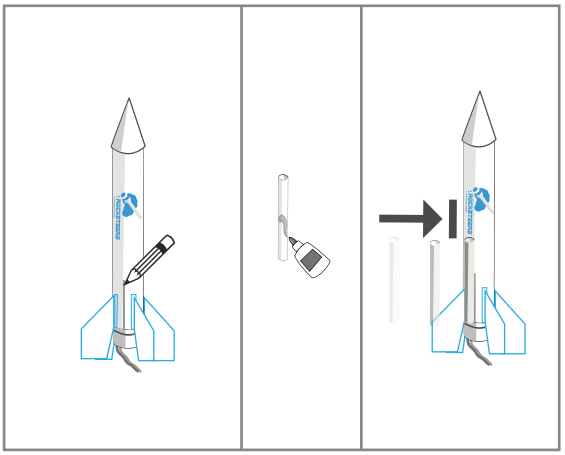
10. Take the Swing test



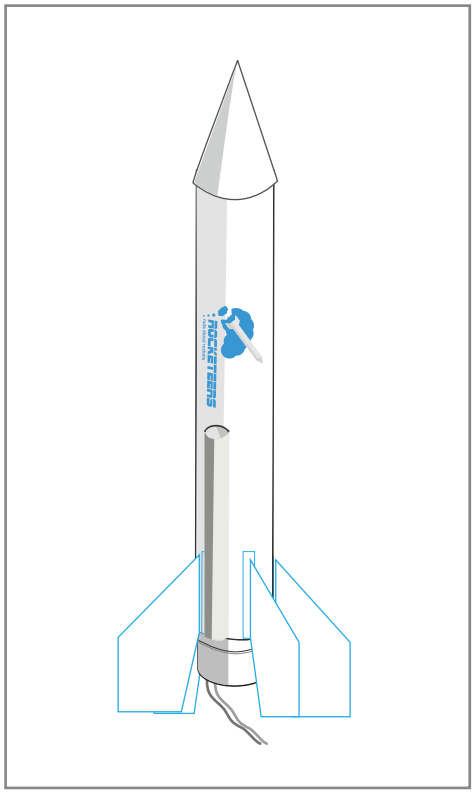
9. Cut out the launch lug and make it into a 7 mm tube.



10. Draw a straight line between two edges and fins.
11. Take the launch lug and apply adhesive on the bottom, and paste it straight on the line.



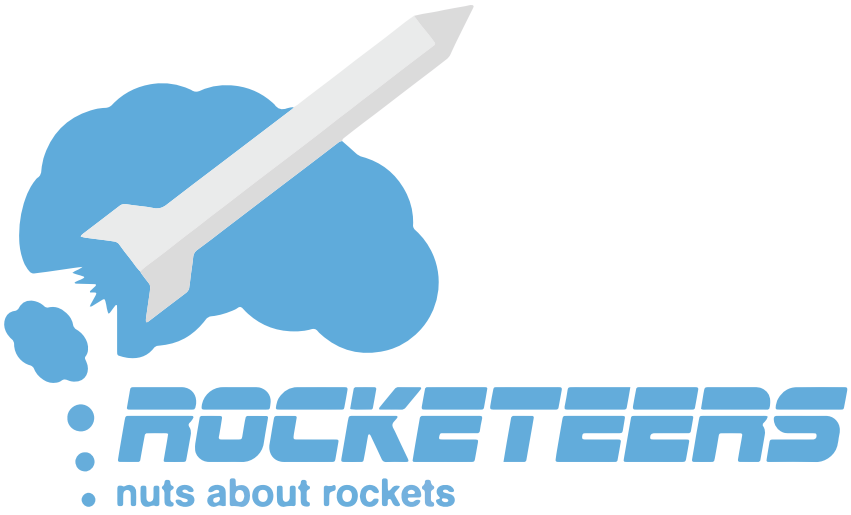
12. The rocket is ready!



Launch:

1) Take the rocket to the field and place it on the launcher

2) Assemble the igniter element on the motor wick and prepare the igniter assembly.
3) LAUNCH!



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