

Art Applewhite Rockets

from deep in the heart of Texas



Popsicle Stick Monocopter

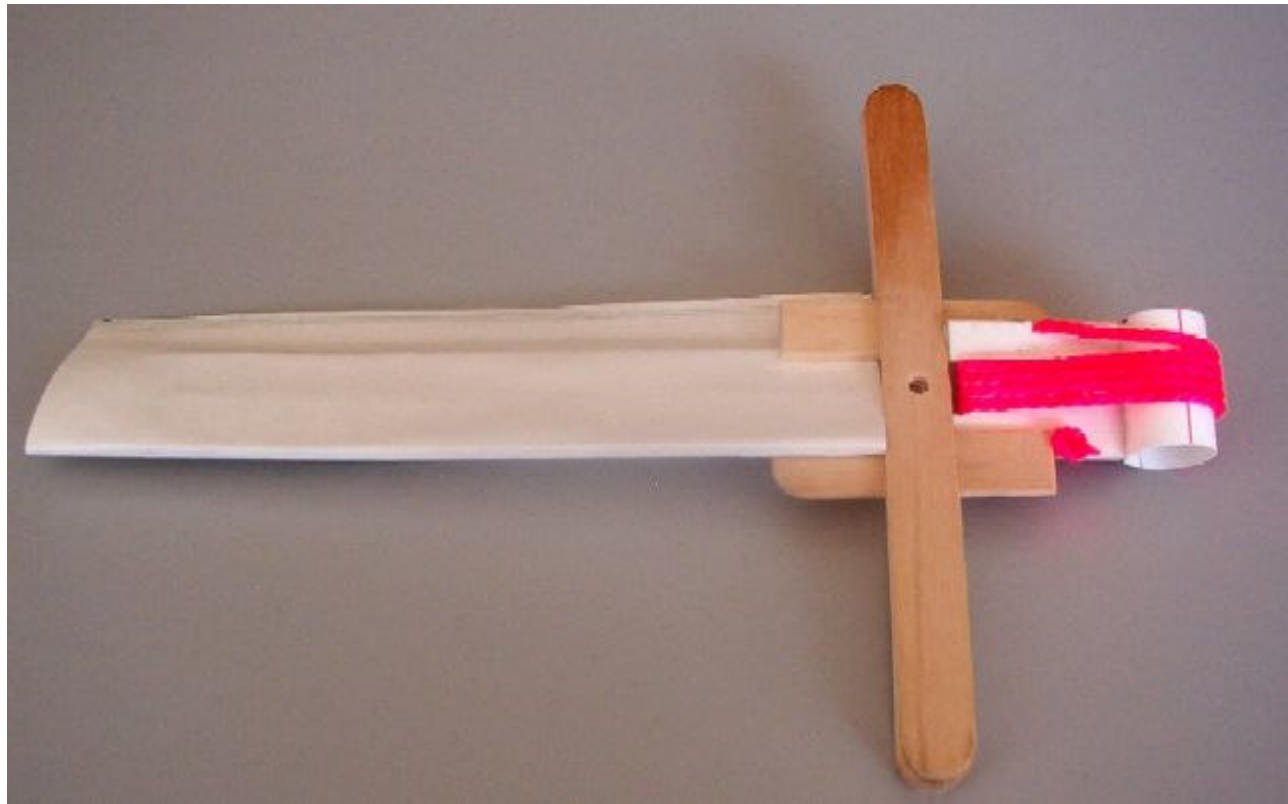
If you build one, or have any question please email me at rocket877@aol.com

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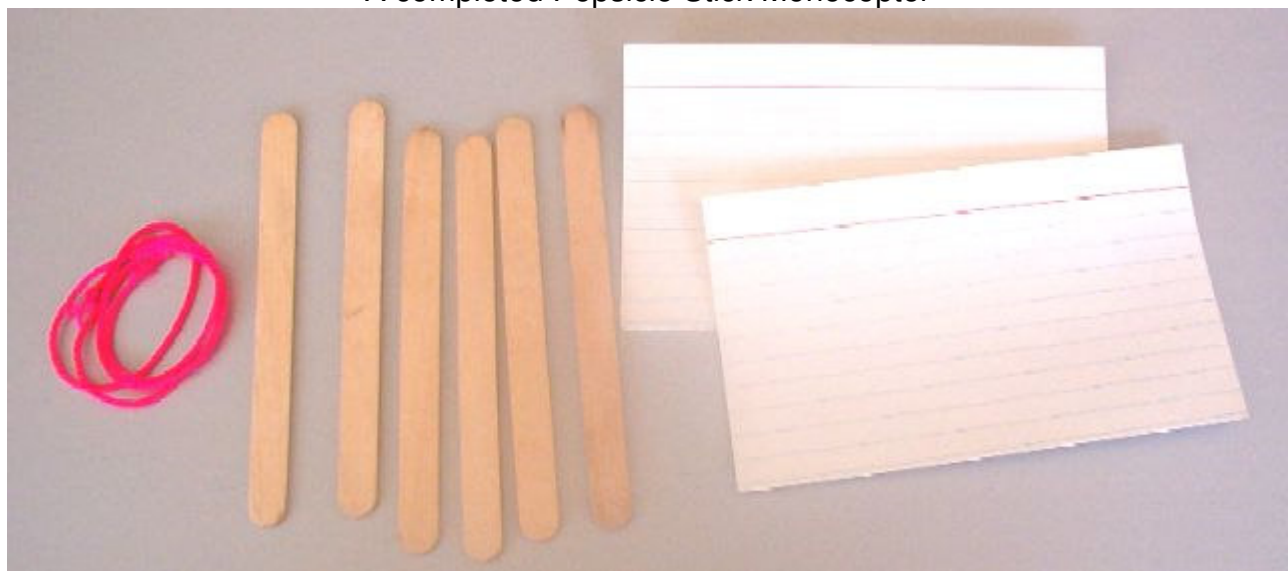


The Popsicle Stick Monocopter on a A3-4T at apogee (about 100 feet) (Click on picture to enlarge)

[Click here for a YouTube video of the Popsicle Stick Monocopter in action](#)



A completed Popsicle Stick Monocopter



Materials needed:

18" of nylon cord, 6 popsicle sticks (4.5" long and 3/8" wide), 2 - 3" x 5" index cards
(Tip: Make sure the popsicle sticks are straight, smooth and clean.)

Tools and Supplies needed:

#11 X-Acto knife

Scissors

Ruler

Pencil

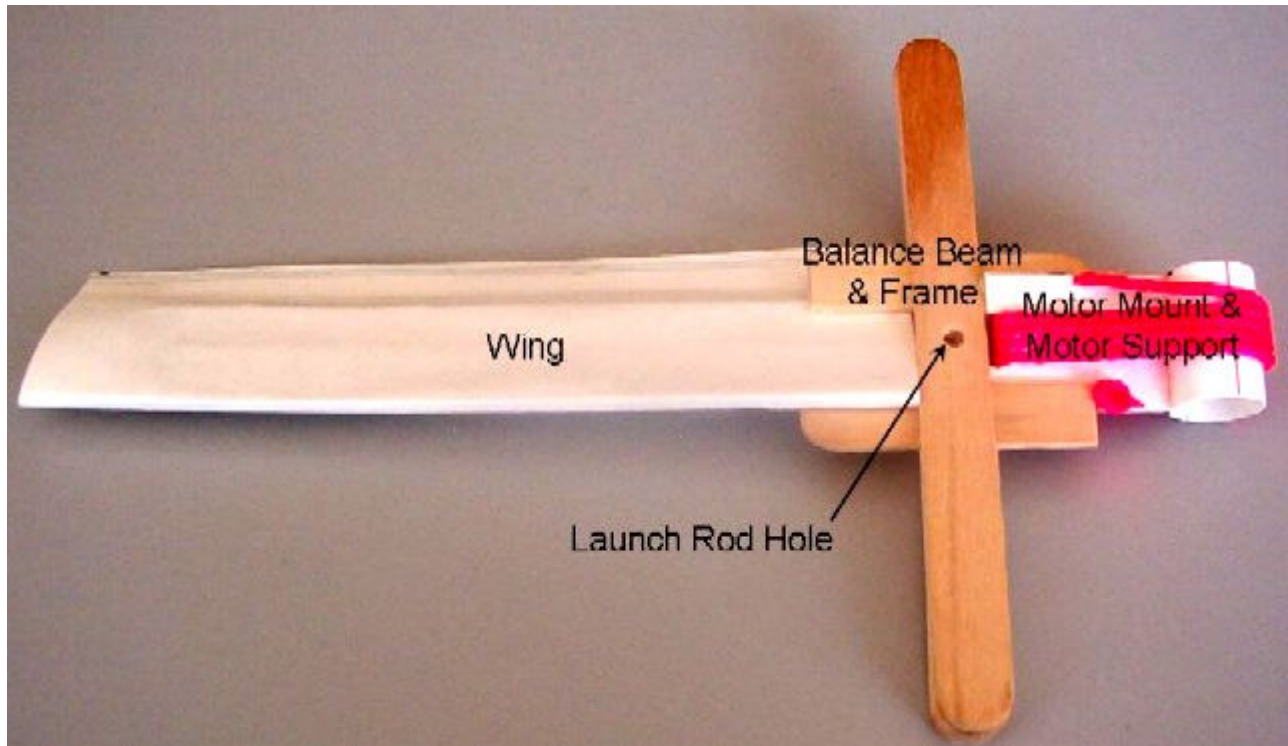
Ball point pen

1/8" Drill Bit

Electric Drill

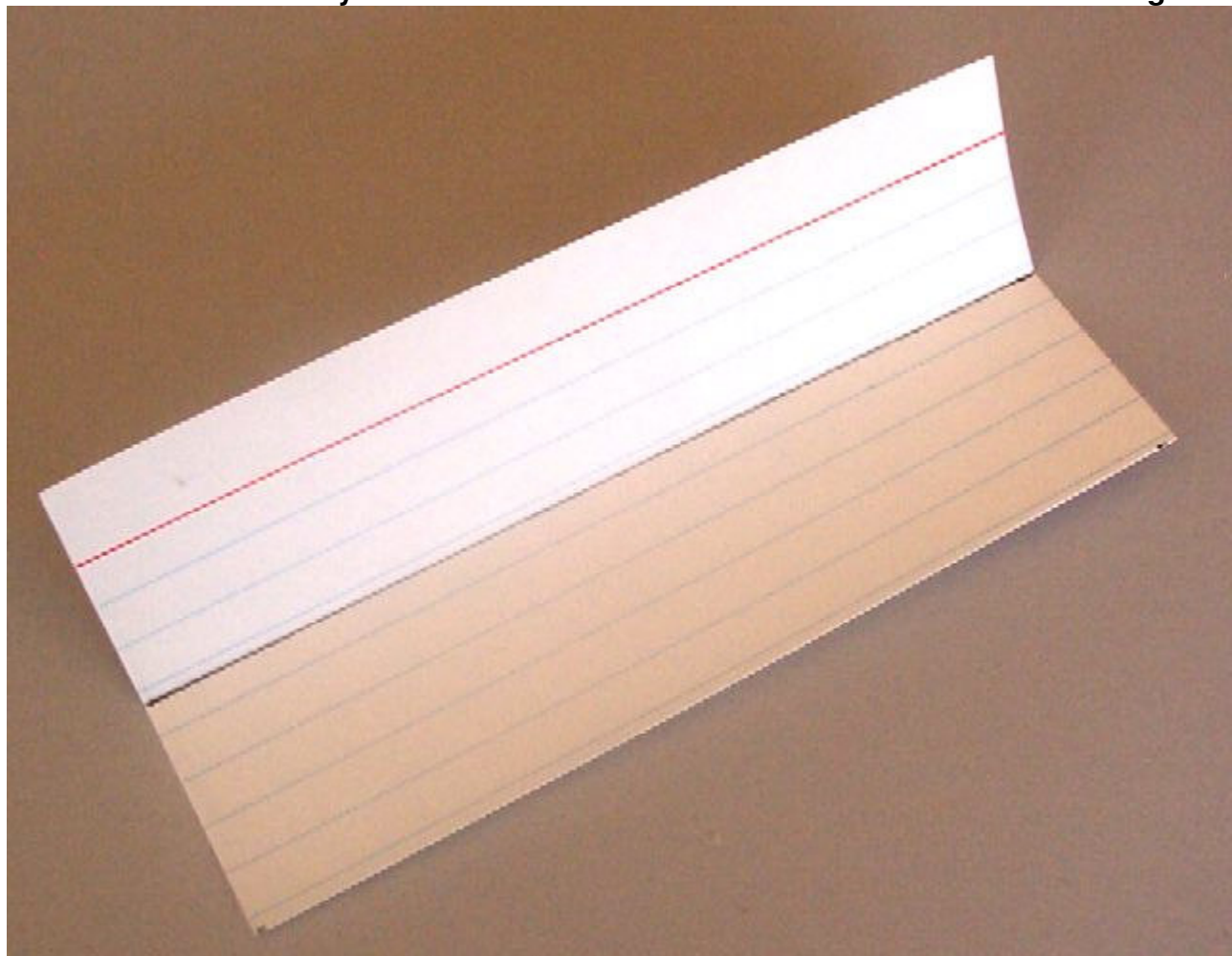
4 to 6 clothes pins

Elmer's Glue-All



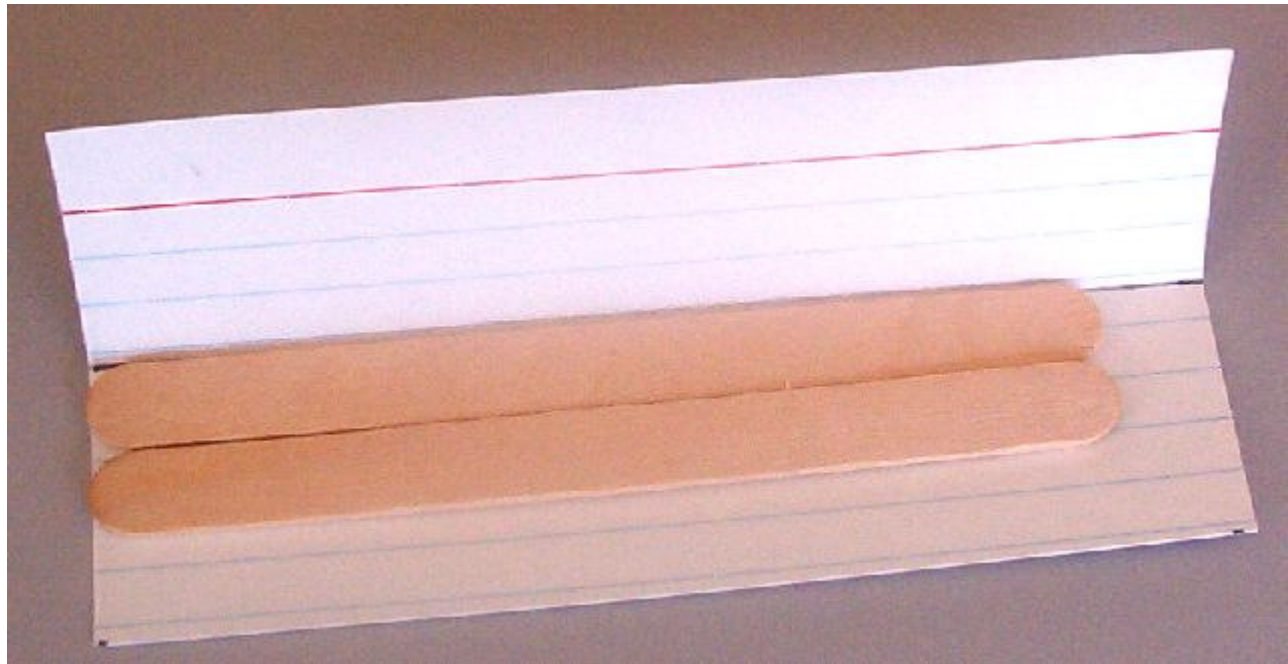
The main parts

I recommend that you read all the instructions and then start with the Wing



Cut one of the 3"x5" index cards down to 2.5"x5".

Make a line down the middle of the card and fold on the line.

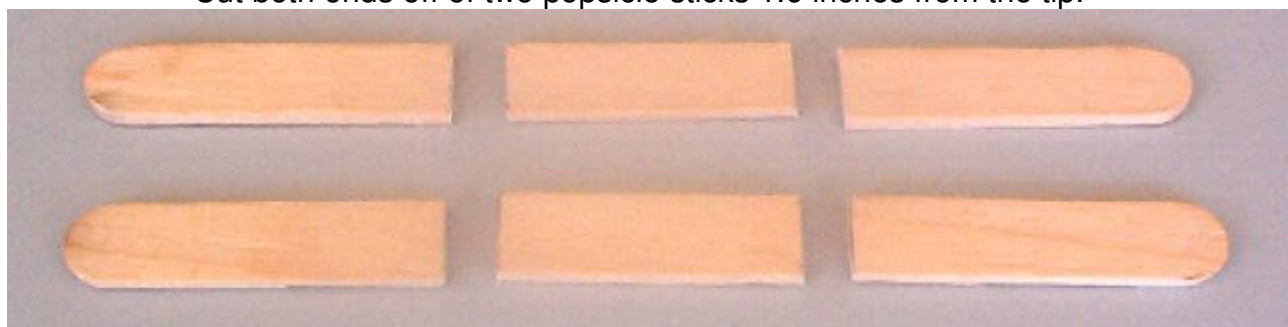


Glue two whole popsicle sticks side by side on the index card. The ends of the sticks should be flush with one side on the card and against the fold.

The Balance Beam



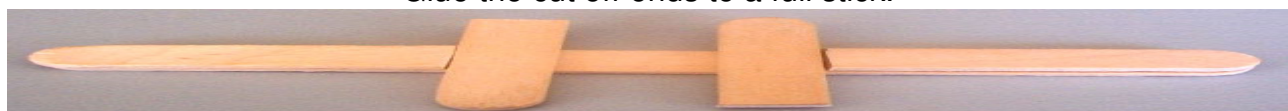
Cut both ends off of two popsicle sticks 1.6 inches from the tip.

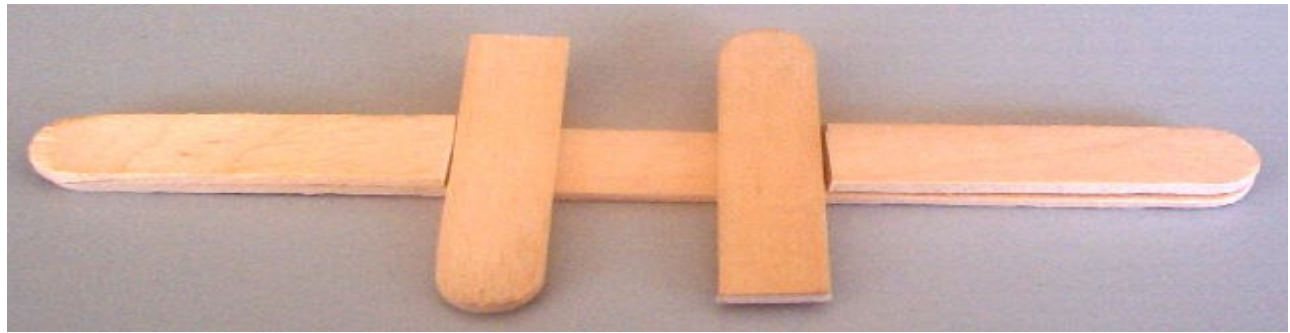


Make sure the cuts are clean and straight across the sticks. Sand the ends of all the pieces to make them smooth and free from splinters.

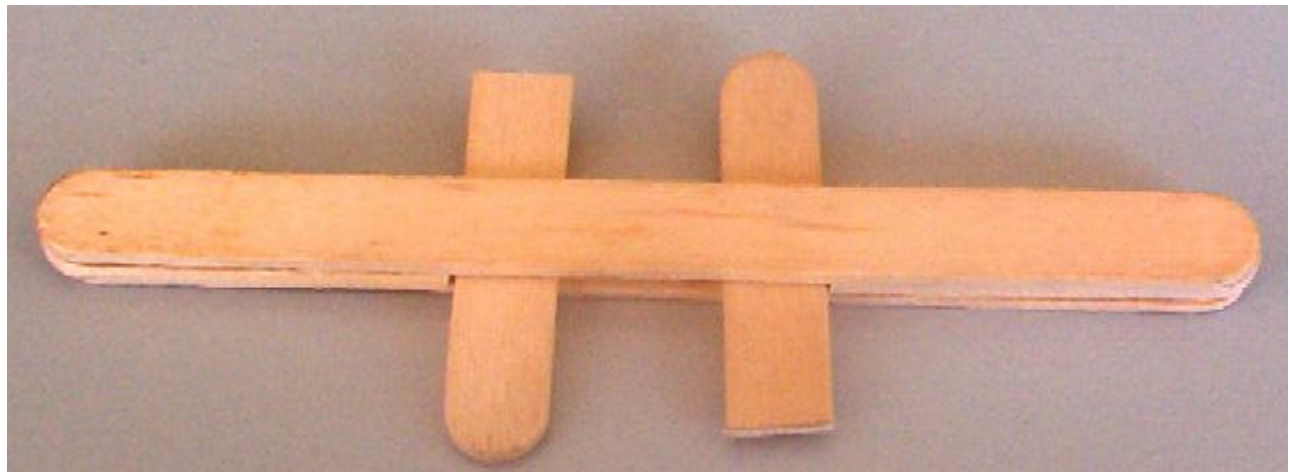


Glue the cut off ends to a full stick.

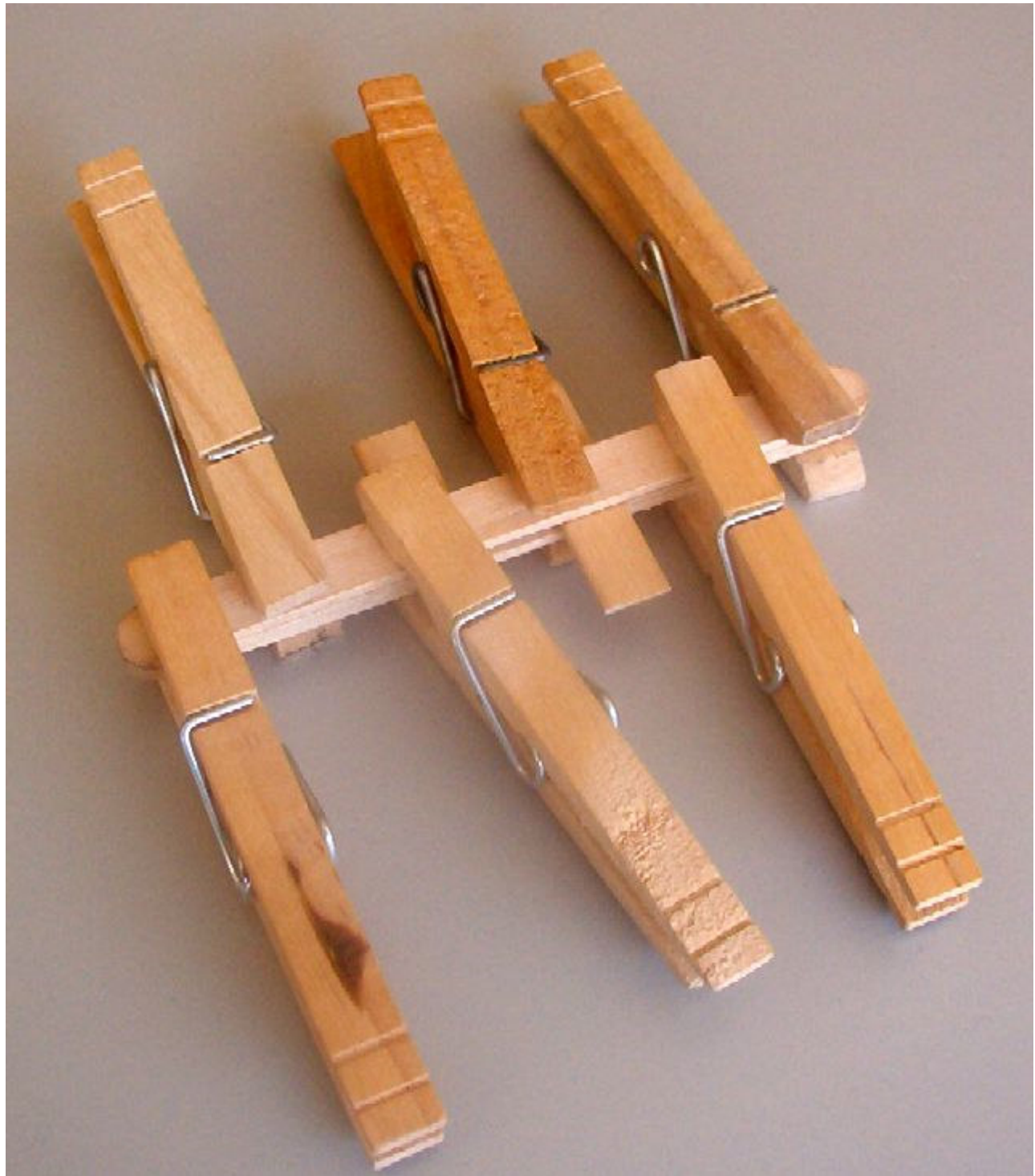




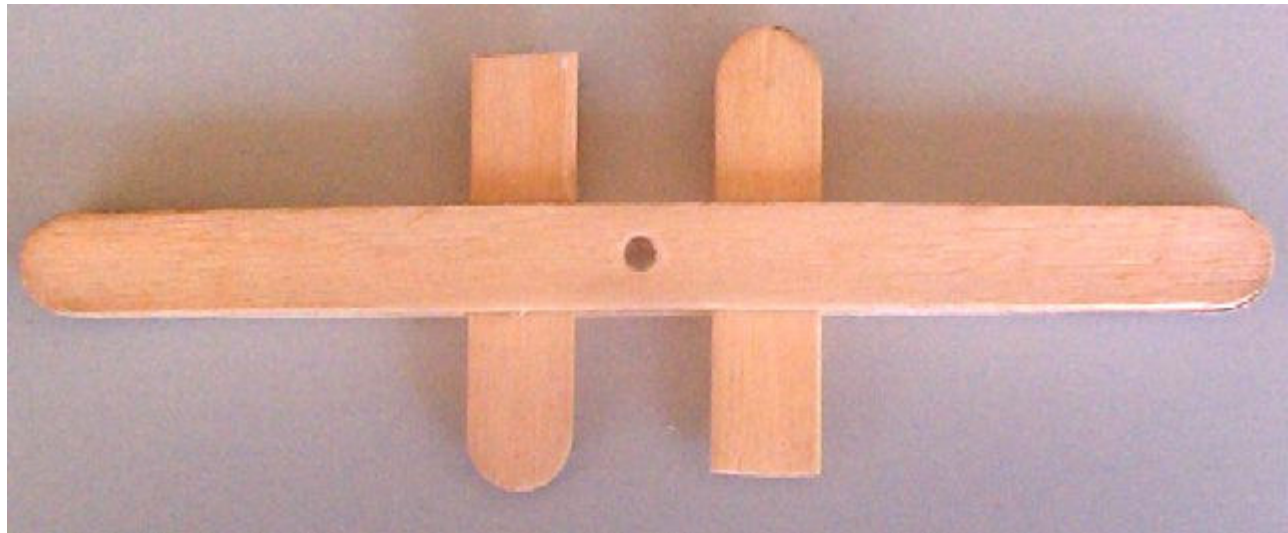
Glue two more cut off sticks at a 90 degree angle to the balance beam.
Both sticks should be centered across the balance beam.



Glue the final whole stick on top of the balance beam.

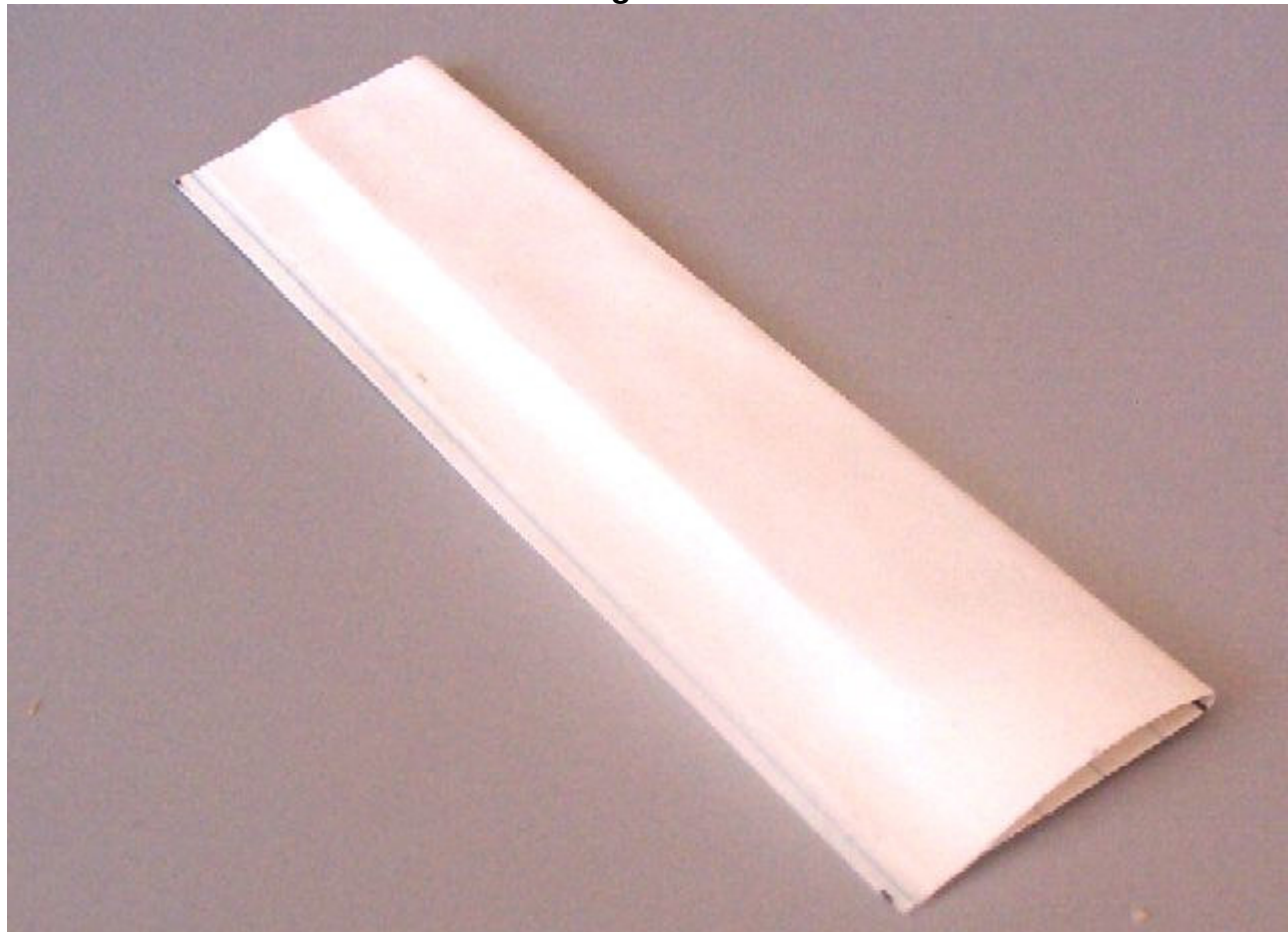


Tip: Use clothes pins to hold everything together until the glue dries.



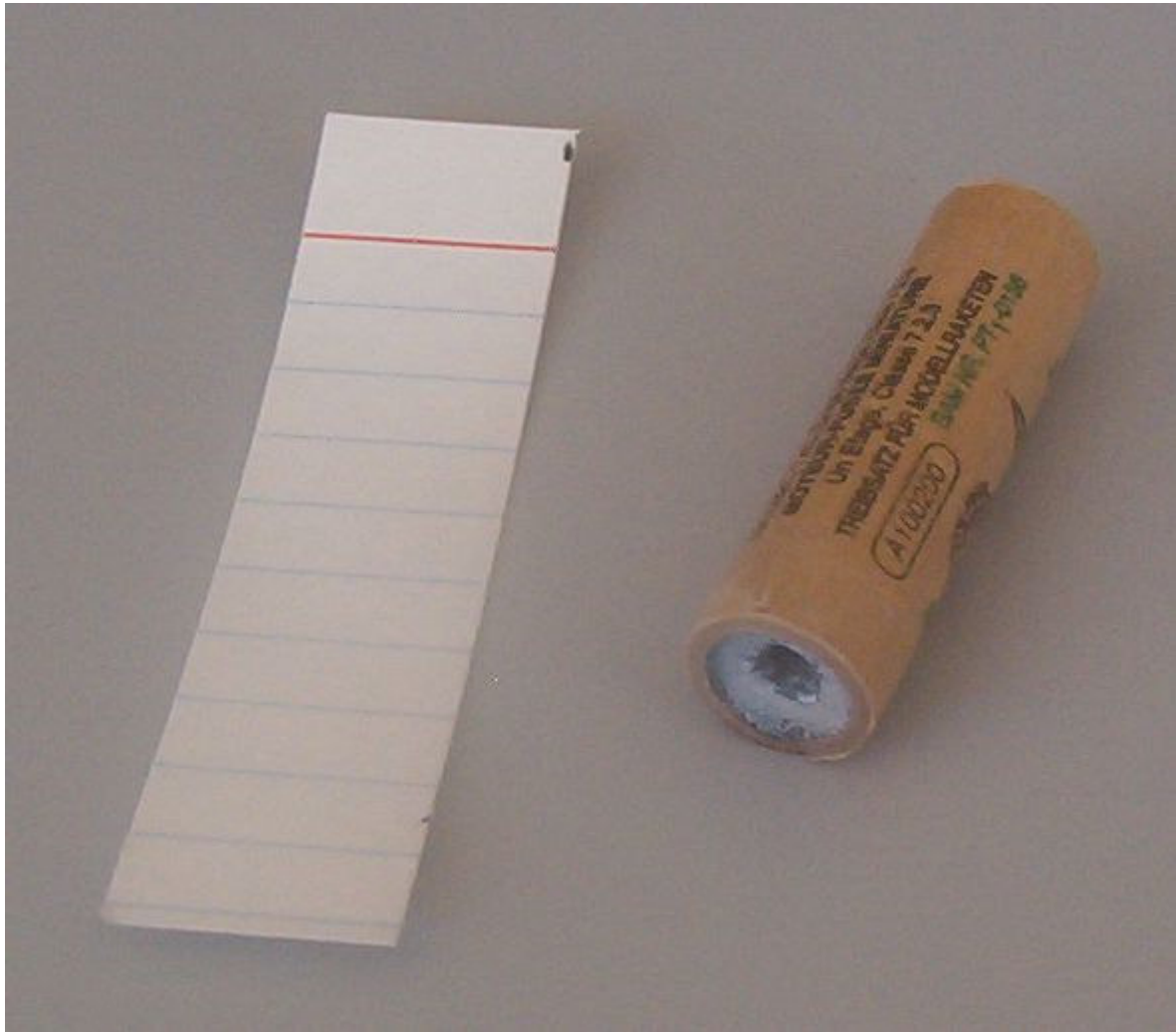
Once the glue is dry, carefully drill a 1/8 inch hole in the exact center of the balance beam. Drill through both sticks making sure the holes are perpendicular to the balance beam.

The Wing: Continued



Glue the index card flat against the top of the sticks and the back edge of the card.

The Motor Mount

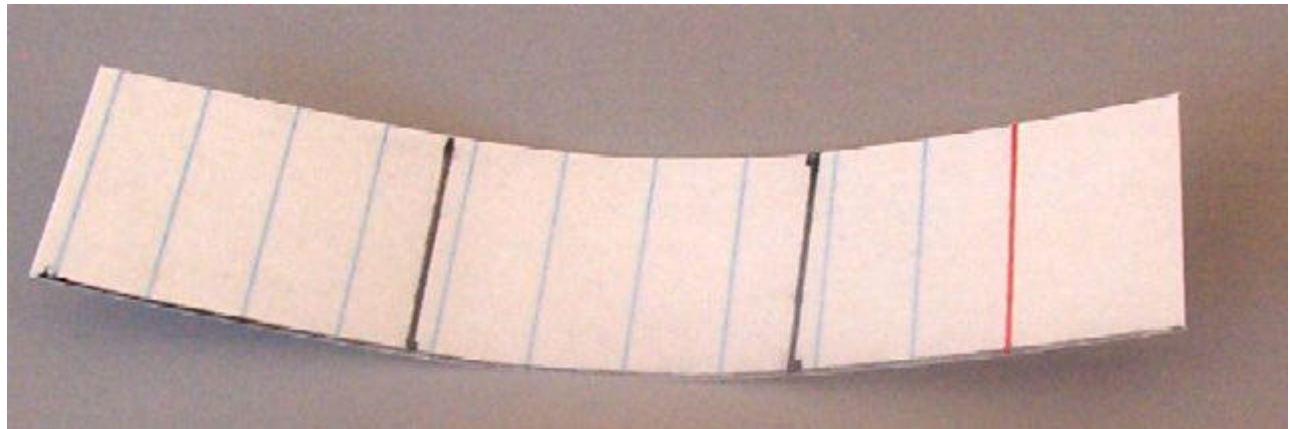


Cut a 0.75" x 3" strip off the other index card.

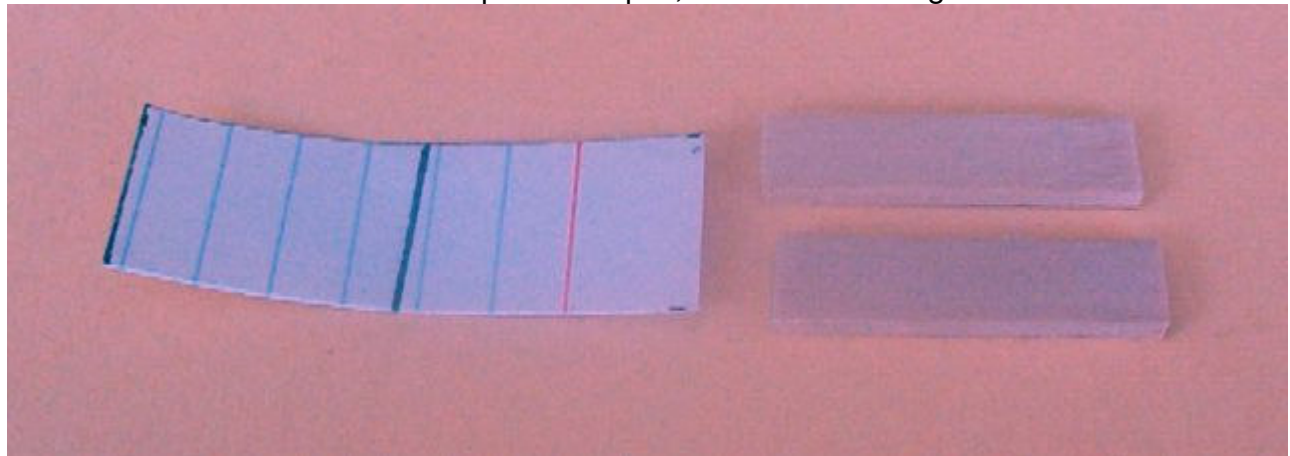


Wrap the strip around a 13mm motor and glue the end down to form a 0.75 inch wide tube.
Tip: Be careful not to glue the tube to the motor or roll the tube too tight.
Some motors are a little fatter than others.

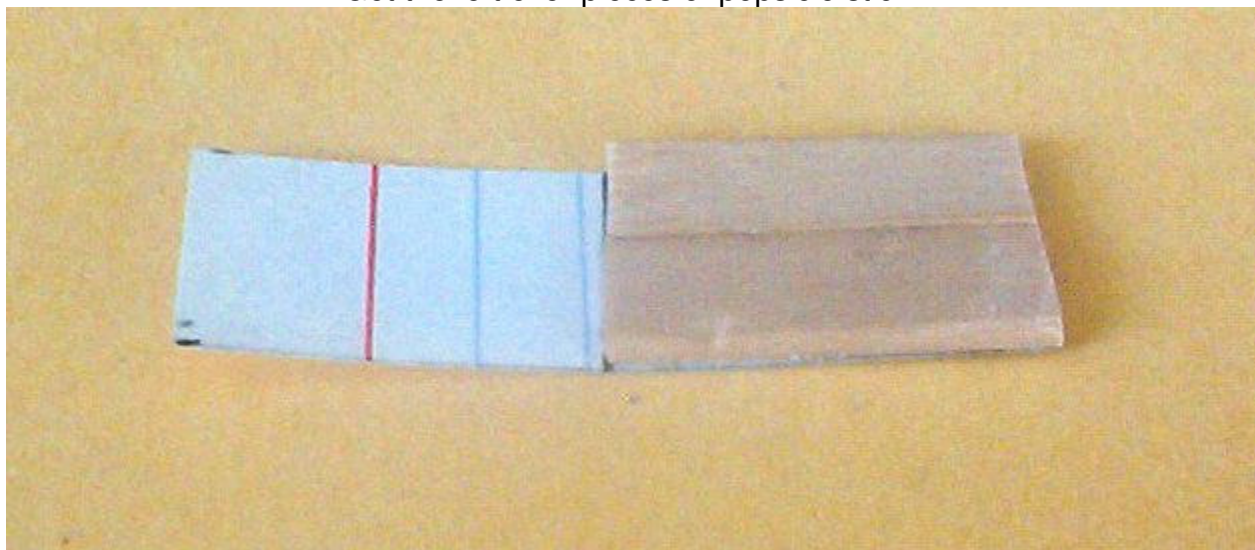
The Motor Support:



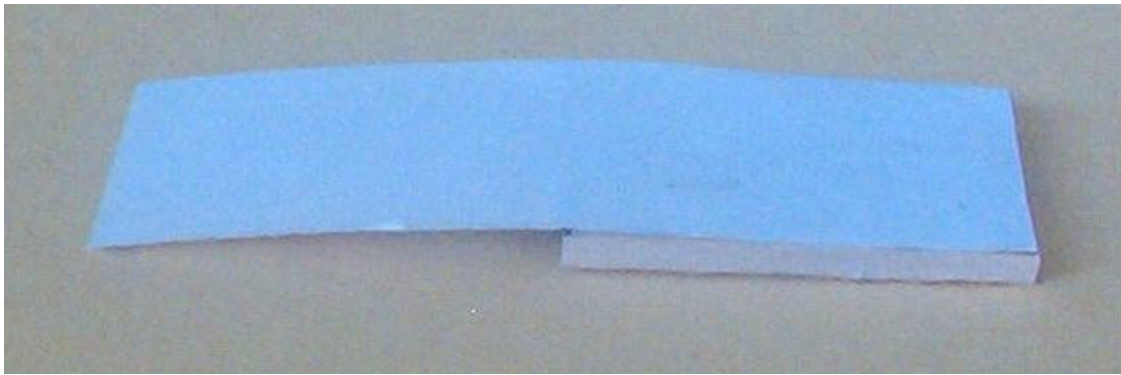
Cut another 0.75" x 3" strip off the index card.
Divide this strip into 3 equal, 0.75" x 1" rectangles.



Cut one square off the end.
Get the left over pieces of popsicle stick.



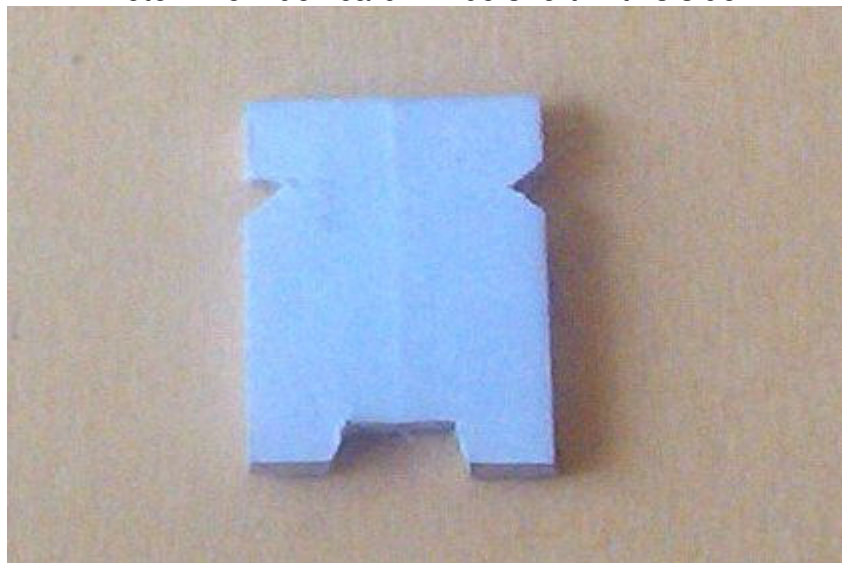
Glue the two left over pieces of popsicle stick to the index card.



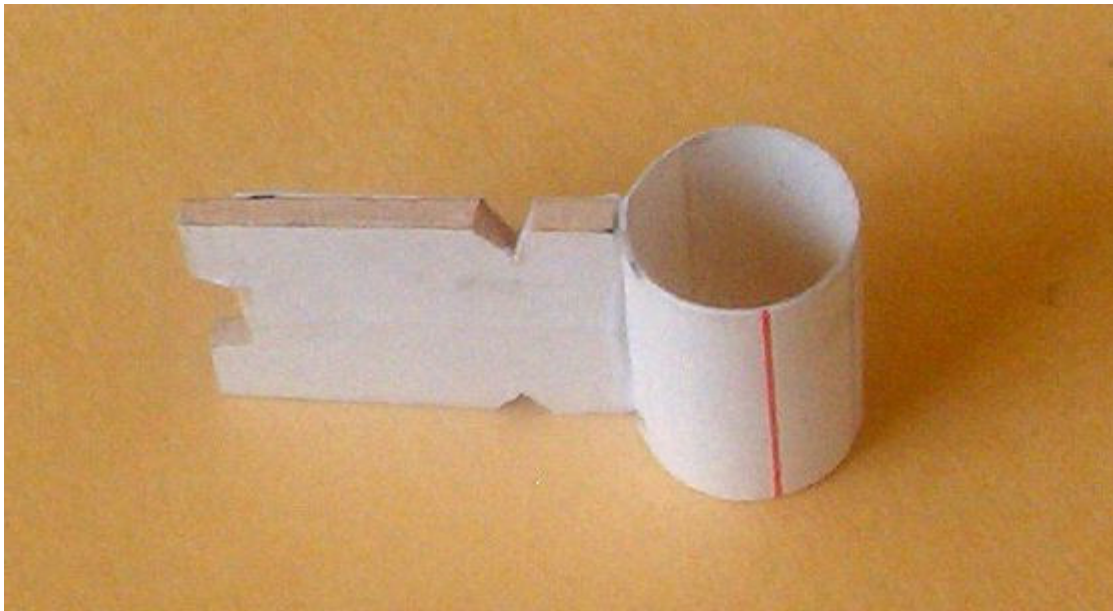
Cut off the sticks where they stick out the end of the index card.



Fold over the index card and glue it to the sticks.
Note: The index card will be short in this side.



Cut notches in the sides and one end of the Motor Support for the nylon cord.



Glue the Motor Mount tube to the flat end of the Motor Support



Put a drop of glue in one of the side notches in the Motor Support and put the end of the nylon cord in the notch. Allow the glue to dry.



Wrap nylon cord around the Motor Mount tube and Motor Support 4 times.
Put the end of the cord in the side notch and glue.

Tip: Don't wrap the cord too tight as this will distort the Motor Mount tube.

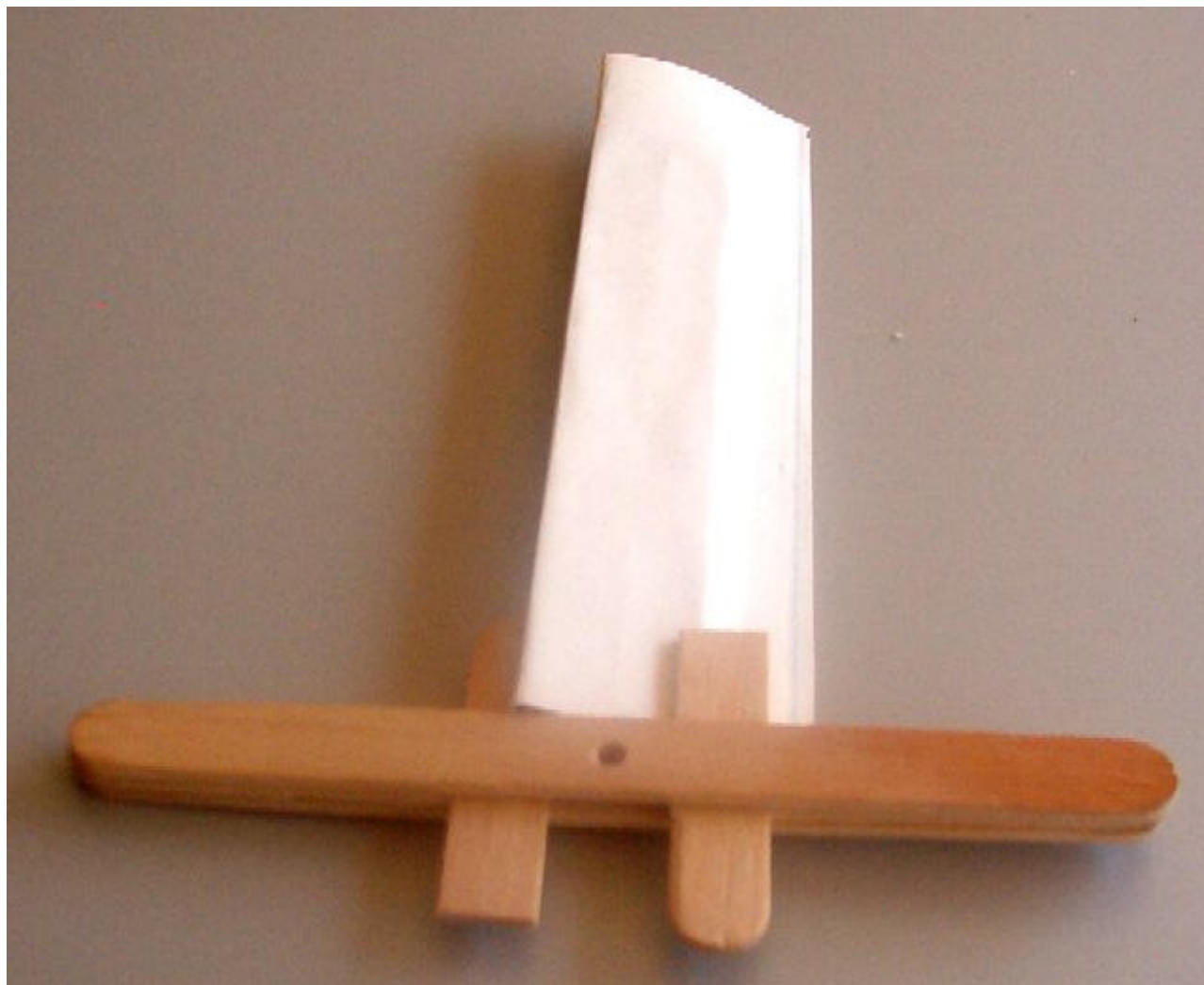


Tie a knot in the nylon cord where it meets the Motor Support. Cut off the excess cord.



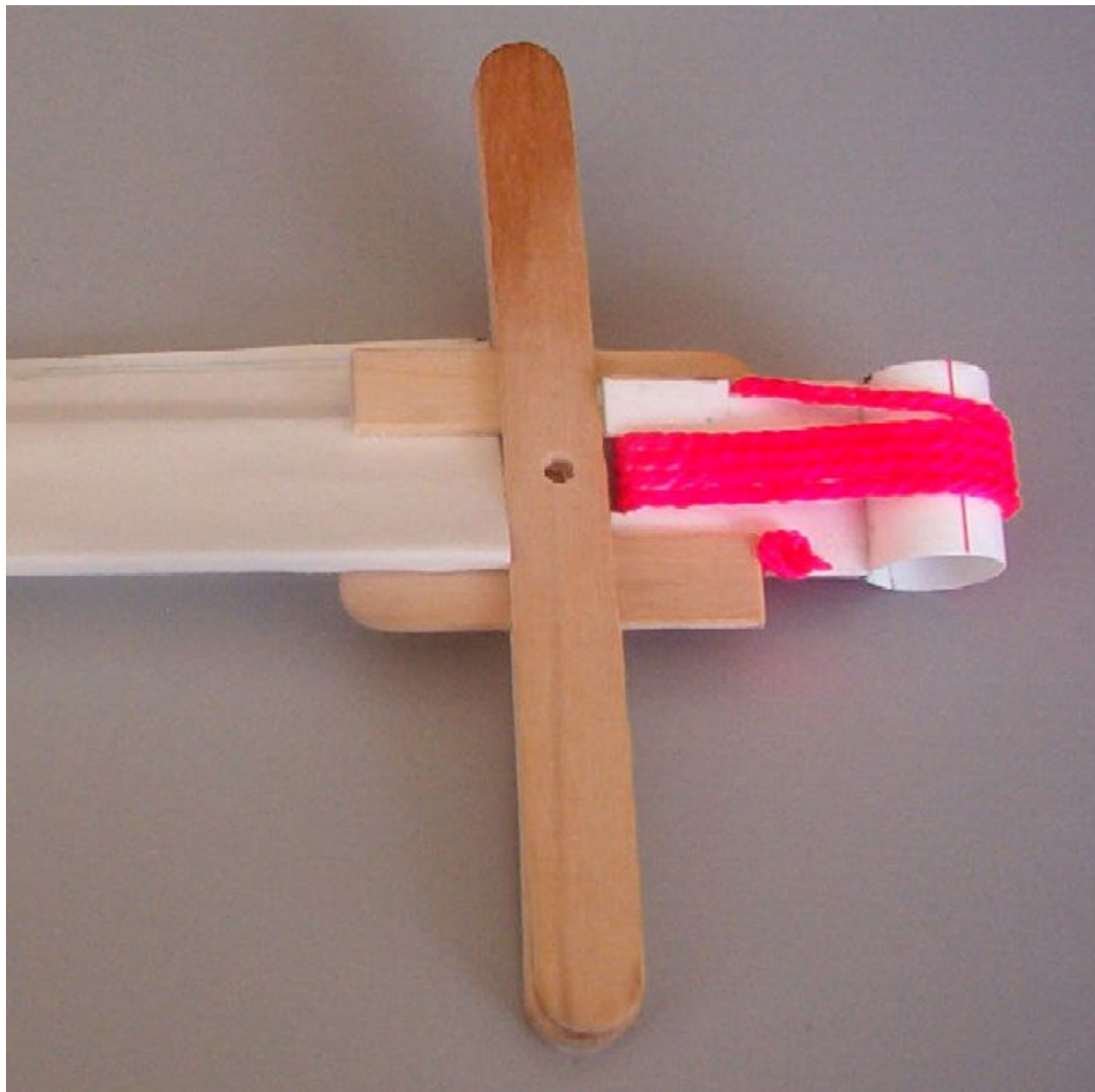
Saturate the cord with glue to stick it firmly to the Motor Mount tube and Motor Support.

Final Assembly:



Glue the Wing to the Balance Beam so that the leading edge is tilted up and the root edge is against the balance beam.

Tip: The long axis of the wing should be perpendicular to the Balance Beam.

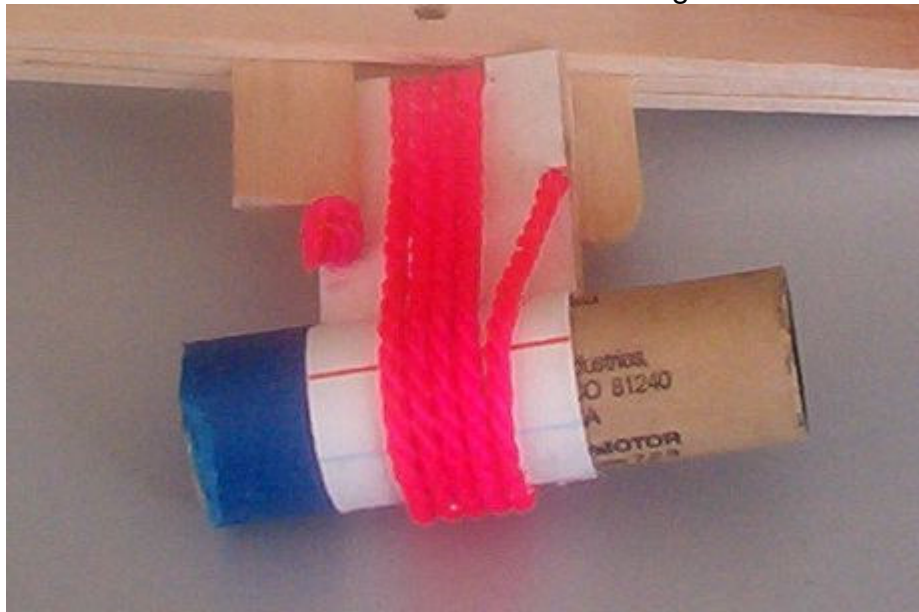


Glue the Motor Support to the Balance Beam opposite the Wing.
Make sure the Motor Support is tilting in the opposite direction from the wing.
Add a fillet of glue to all the joints between the Wing, Frame, Balance Beam and Motor Support

Flight Preparation:
Recommended motor for first flight: 1/2A3-2T
Later flights: A3-2T, A10-PT, A10-0T, A10-3T



Wrap 3 layers of masking tape 3/8" from the nozzle end of a 13mm motor.
Trim off the excess. This will be the thrust ring for the motor.



Check the fit of the motor in the Motor Mount. If it is loose, add masking tape around the motor until it is snug in the motor mount. Make sure the nozzle is pointing downward. Use a 1/8" diameter, 3" long launch rod. Do not use a long launch rod because the rod to whip around uncontrollably during take off. Put the monocopter on the launch rod through the holes in the Balance Beam. The launch rod should not stick up more than 1/2" inch above the balance beam. Insert the igniter and attach the launch controller clips. Be careful to keep the wires out of the way of the soon-to-be, rapidly spinning wing. You should consider using **twice** the minimum safe distance with this rocket until you become comfortable with it's flight characteristics.





Prototype #4 in Orange ready to take off of an Estes Port-A-Pad.

If you like this design, please send a comment to Art Applewhite rocket877@aol.com
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