

Popsicle Paddle Boat

UConn 4-H Summer S.T.E.M.

Background

This fun STEM activity was created by Joseph Huff. Joseph was the 2020 national 4-H Youth in Action winner. He built a self-propelled boat while exploring the skills needed for 3-D modeling and printing. In this lesson we will also explore water resistance, thrust, and how energy is transferred from one item to another.

Supplies and Tools

Craft sticks, rubber band, sand paper Hot glue gun or wood glue Scissors or utility knife, a ruler A tub, pond or basin of water



Activity Steps

Notes

1. Cut a craft stick in half lengthwise. Place the 2 pieces on a table. Take a 2nd stick and cut it in half. Sand the rough edges. Lay the cut pieces in between the 2 full length sticks with the half pieces slightly farther out front as shown.

2. Cut strips out of another stick that can lay across the width of the boat. Put a strip of glue in front of the opening to attach each of these sticks across the top of the first sticks you set up. Attach the cut sticks on the glued area. Place 2 more at the back of the boat.

3. Cut 2 shorter lengths to run along the 2 sides between the sticks you just placed leaving a gap in the center for the rubber band. Place 2 more full length sticks across the top. The boat should now have 3 layers.

4. Cut 2 pieces out of a stick slightly smaller than the gap in the center of the boat. Stack the cut sticks on each other, then turn onto their sides. Cut a groove into both sticks ½ way through the 2 sticks. Sand the pieces and make sure the edges are rounded.

5. Interlock the 2 paddle blades. Run the rubber band through the opening at the center of the boat and loop the ends around the rear of the boat. Connect the paddle wheel in the center and wind until you have tension in the rubber band. Place in the water.

Bonus Activity: Try using other materials to build your boat. Make your boat larger or smaller. Use a different kind of rubber band or different material for the paddle wheel. How do these changes affect the efficiency of the boat? Count how many turns of the rubber band it would take to achieve a particular distance or build two boats and race a friend.

Visuals











Career Connection: Ciara Beausang is a researcher in Ireland who uses scientific modeling in order to run many of her experiments. A scientific model is a representation of reality. They can be physical, conceptual or mathematical to provide a better understanding of the world around us. Ciara uses computer modeling to simulate problems that are too large or complex to address in real world research.

https://www.youtube.com/watch?v=aNrDeObbOTg

If you enjoyed this project, visit <u>4-h.extension.uconn.edu</u> to learn more about **UConn 4-H.** Check out the **UConn Extension YouTube** page to view the video associated with this activity.

You can also find more fun, hands-on learning activities at **Clover by 4-H.** To discover a wide selection of 4-H activities and online courses, visit <u>4-H.org/Clover</u>.

Lesson adapted from "Popsicle Paddle Boat" by HughesNet through the Clover by 4-H online learning platform.

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