

## SUPER SAILS! - LESSON 3

### DragonFly TV (PBS) Episode – “Sailboat Design by Max and Brian”

<http://pbskids.org/dragonflytv/show/sailboat.html>

We're Max and Brian, and we both love to sail. When we're not sailing in our 15-foot boats, we sail models. We even sail them when we visit the California Science Center. There's a cool sailboat exhibit here, where you can make models of different shapes, sizes, and sail types. Our question was: which kind of boat sails faster, a single-hull or a double hull boat?

What did we do?

We found a single-hull model and a double-hull model and raced them at the California Science Center. The double-hull won! But we noticed that the two models didn't have the same sail, and they didn't weigh the same, and they didn't have the same amount of boat surface touching the water. We adjusted the models so each of these factors was the same for both boats. The double-hull still won, but just barely. We decided to race each other in our real boats out on the bay to settle the score.

What did we find out?

Judging by the numbers, Brian's double-hull catamaran seemed to have the edge over Max's single-hull Lido. The catamaran had a bigger sail, carried less weight, and had less surface area in the water, meaning less drag, than Max's Lido. In the first part of the race, Brian did take the lead. However, in the second half of the race, Max pulled ahead because the Lido maneuvered more easily than the catamaran. In a real sailboat race, there's more to speed than sail size, weight, and drag.

What can you do?

- How does the size of a sail affect how well a sailboat zips along? Build a simple sailboat and make some different sail sizes to find out. Take it to a lake or pool when there's a nice breeze and see how well each sail catches the wind. Does a bigger sail always make the boat sail faster? Is it possible to make a sail that's too large?
- Investigate other kinds of wind-powered vehicles, like wind cars. Make a three-wheeled wind car and a four-wheeled wind car. Make sure they have about the same weight and sail size. Does one of them have a racing advantage over the other one?
- Use this sailboat investigation as a science fair project idea for your elementary or middle school science fair! Then tell us about it!

