

BOAT RACING

Science | Engineering

Objective

Students will engineer torsion powered boats to race head to head against their classmates.

Materials

Race Course:

(2) 5 in x 10 ft Vinyl K-Style Gutters

(2) 5 in. Vinyl K-Style End Cap Set

Hose with Water Access

Sharpie

Student Supply Examples:

Plastic To-Go Containers

Plastic Bottles

Styrofoam Blocks

Pencils

Craft Sticks

Rubber Bands

Spoons

Milk Cartons

Time

Suggest (2) 45 min blocks.



Lesson Overview

Row, row, row your boat! In this lesson students will engineer their own torsion powered paddle boats to race against classmates. Torsion is the twisting of an object due to applied torque. To create this movement students will create paddles that will be twisted around rubber bands. As the paddle is released so to is the energy, propelling the boat forward in the water!

Pre-Lesson Teacher Prep

There is no right or wrong way to build a boat! Set students up for success by providing them with a variety of building materials





Video Examples

Coming Soon....

Keep an eye on my YouTube @that_stem_guy over the coming days for a video demonstrating different building techniques!

Reflection Questions

What was the strategy in your lab group?

What worked well?

If you had to do this again what would you do differently?

What were some common design elements of the most successful boats?

What were some common design flaws of some of the unsuccessful boats?

they can use to construct their designs. For the hull of the boat I recommend supplying ample plastics or styrofoam. For the paddle system I recommend providing lots of spoons, craft sticks, or plastic scrap and of course lots of rubber bands!

I chose to use vinyl rain gutters for my racing lanes. This way the perimeters were the same for both sides of the track.

Student Building Instructions

Students will work in groups of 3-5 students. Remind students that they will need to design something to “loop” their rubber bands around. Materials that work well for this are durable boba straws, pencils, craft sticks, or chop sticks (see image below)

Set size constraints for your student’s boats. I chose to use the following: Boats can not be longer than 10 in. end to end; Boats could not be wider than 4 in. Propellers could not be longer than 3 in end to end.

These perimeters worked well for the recommended gutters. If you are using a different course setup adapt as needed.

Allow students to experiment with their design. Some may even choose to add a sail, which could be helpful on race day!

