

26. Sail Car

Classroom Activity: Design and construct a sail car that will move in the wind generated by a large fan. A force diagram (free body diagram) is expected.

Grade (s): 11 and 12

Course(s) and Strand (s): Science

Physics, Grade 11 University

B. Kinematics

C. Forces

Physics, Grade 12 University

B. Dynamics

Physics, Grade 12 College

B. Motion and its Applications

See supplementary document Ontario Curriculum Alignment for Engineer-in-Residence Secondary Classroom Activities: Science and Technological Education for relevant overall and specific expectations.

Assessment Categories:

- Knowledge and Understanding
- Thinking and Investigation
- Communication
- Team-building skills

Type of Activity: Science lab/ Independent study (individual/group)

Preparation: Approx. 30 minutes

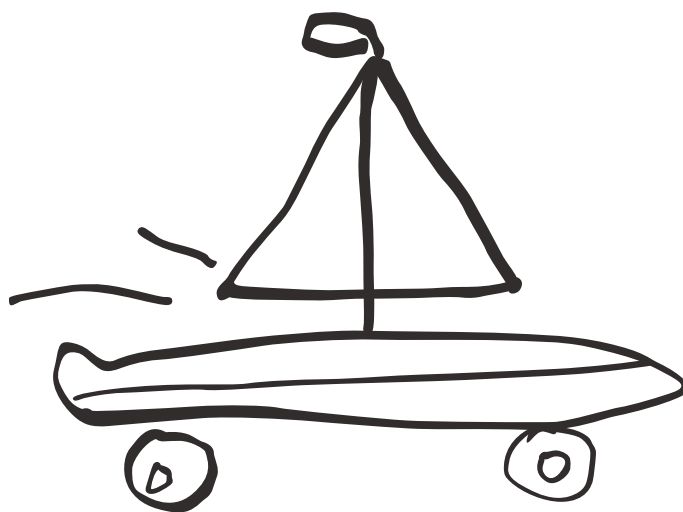
Time needed to complete the task: 75 minutes in class (students expected to research subject outside class)

Materials and Resources for Teachers:

<http://ldaps.ivv.nasa.gov/Workshop/StAgnes/support/sail-car.html>

<http://best.me.berkeley.edu/~aagogino/IU/mdrules/sailsenior.html>

fan



Materials and Resources for Students:

4 sheets of 8.5 X 11 paper

clear tape

empty pop cans

2 coat hangers

6 straws of various diameters

plastic for wheels

scissors

glue gun

Activity Description:

Session 1: Theory

Review aerodynamics, Newtonian physics and discuss sailing. Compare the wing of an airplane to the sail of a boat. Outline the contest. Students are divided into teams and expected to research the project outside of class.

Session 2: Building and Testing

Teams build their sail cars and they are tested. The sail car that moves the greatest distance, the fastest wins. The length of test track is determined by the power of the fan. Bonus points are awarded if the sail car can move into the wind (towards the fan).

Cross-disciplinary Connections: Social Studies