



Turn Wind into Thrust — The Science Behind the Magic

Hitch a ride into the world of sailing! This course investigates how pressure relates to the force of wind and how sailboats use that 'push' to drive downwind. Focusing on the science of sailing, students explore the relationship with how sail design relates to potential power. Compete with your team for a chance at your own "America's Cup", where the engineering process and teamwork is everything.

Grade: Middle School

Standards Supported

Next Generation Science Standards:

MS-ETS1-3. Engineering Design

Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MS-ETS1-4. Engineering Design

Develop a model to generate data for interactive testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

MS-PS2-2. Motion and Stability: Forces and Interactions

Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

MS-ESS2-5. Earth Systems

Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.

Ocean Literacy Principles:

Principle 3. The ocean is a major influence on weather and climate.

A.1. Heat exchange between the ocean and the atmosphere drives the water cycle and oceanic and atmospheric circulation.

Principle 6. The ocean and humans are inextricably interconnected.

A. 10. Humans obtain energy from the ocean via wind, wave, oil, and natural gas.

B. 2. Humans have historically used, and continue to use, the ocean for transportation, commerce, recreation, and inspiration.

C.6. The ocean is a source of inspiration, recreation, rejuvenation, and discovery. It is also an important element in the heritage of many cultures.

Principle 7. The ocean is largely unexplored

A. The ocean is the largest unexplored place on Earth—less than 5 percent of it has been explored. The next generation of explorers and researchers will find great opportunities for discovery, innovation, and investigation.

F. Ocean exploration is truly interdisciplinary. It requires close collaboration among biologists, chemists, climatologists, computer programmers, engineers, geologists,



meteorologists, meteorologists, physicists, animators, and illustrators. And these interactions foster new ideas and new perspectives for inquiries.