



## Sailing — Sailing at Home

*This course is an investigation into what forces move boats, how humans capture wind to build sea-worthy sailboats, and how this has evolved over time. Students engineer their own wind-powered vehicle and put it to the test.*

**Grade:** Elementary, Middle School

### Standards Supported

#### Next Generation Science Standards:

**ETS1.B:** Developing Possible Solutions Both physical models and computers can be used in various ways to aid in the engineering design process. Computers are useful for a variety of purposes, such as running simulations to test different ways of solving a problem or to see which one is most efficient or economical; and in making a persuasive presentation to a client about how a given design will meet his or her need

**ETS1.B:** Developing Possible Solutions When evaluating solutions, it is important to take into account a range of constraints including cost, safety, reliability and aesthetics and to consider social, cultural and environmental impacts.

**3-ESS2-2.** Obtain and combine information to describe climates in different regions of the world.

#### **ESS2.D: Weather and Climate**

The foundation for Earth's global climate systems is the electromagnetic radiation from the sun, as well as its reflection, absorption, storage, and redistribution among the atmosphere, ocean, and land systems, and this energy's re-radiation into space.

#### **MS-ETS1-1. Engineering Design**

Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

#### **MS-ETS1-2 Engineering Design**

Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

#### **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.





### **Ocean Literacy Principles:**

**Principle 5B.** Most of the organisms and biomass in the ocean are microbes, which are the basis of all ocean food webs. Microbes are the most important primary producers in the ocean. They have extremely fast growth rates and life cycles and produce a huge amount of the carbon and oxygen on Earth.

**Principle 3A3.** Ocean currents move heat throughout the ocean basins.

**Principle 6.** The ocean and humans are inextricably interconnected.

Use of the Ocean: A) The ocean is essential to the existence of human life on Earth.

People choose to live in coastal areas for many reasons: B1) The ocean is a continuous body of water connecting all land masses, which in turn facilitates exploration, transportation, and commerce.

