Buoyancy & Balance — The Science Behind the Magic

Jump into the world of sailing – learning all about the forces acting on a boat, how and why boats float, and what they need to stay balanced. This course begins to investigate the physics of sailing, while learning from some of the most high-tech boats in the world and experimenting with these forces in our own homes! Put on your engineering hat and gear up for a ride with American Magic!

Grade: Middle School

Standards Supported

Next Generation Science Standards:

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.
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.

Ocean Literacy Principles:

Principle 6. The ocean and humans are inextricably interconnected.
A.8. Humans use resources from the ocean.
A. 10. Humans obtain energy from the ocean via wind, wave, oil, and natural gas.
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.