Engineering Sails
Connections to Next Generation Science Standards

NGSS Performance Expectation		In this unit, youth:
K-PS2-2	Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.	Test how well their sail designs work to move toys (*scoobles)* across a distance using wind energy.
2-PS1-2	Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.	Investigate which materials work well to catch the wind and facilitate motion.
K-2-ETS1-1	Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.	Learn the characters in the story want to use wind energy to send *scoobles* across a distance. They explore materials properties and sail placement to design a sail that solves the characters' problem.
K-2-ETS1-2	Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.	Consider how the placement of sails impacts how well it catches the wind.
K-2-ETS1-3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	Examine and analyze sail designs to see how well they meet criteria.

Connections to NGSS

Crosscutting Concept

Cause and Effect

In this unit, youth explore how wind (cause) affects the movement of the sail so that it transports the *scoobles* across a distance (effect). Through testing their designs, they experience how their design decisions, such as material choice and sail placement (causes) lead to different outcomes in their design's performance (effects). As they iterate their designs, youth observe these cause-effect relationships to improve their sail.