Station 1: Sail Cars

Learning Goals:
This activity demonstrates how wind can be used to propel an object. Experiment with the number, design, shape, and angle of sails to control the direction, speed, and distance of the Sail Car.

This is a great activity for beginners interested in learning how wind can do work.

Time Frame:
Sail Cars can be used as a walk-up or classroom activity. Learning time between 30 seconds and 45 minutes, depending on how much time is spent exploring how different variables affect distance.

Activity:
Build sails to catch the wind and compete to push the Sail Car as far as possible. Test out different variables, like angle, shape, number, and size of sails in order to improve the distance of your Sail Car.

Age: 5-16+

Cost per student:
$0.10

Materials:
Colored paper, bamboo skewers, small rubber bands, scissors, scotch tape, small hole punch, wooden craft balls, corrugated plastic, pencils and markers, roll of colored masking tape, a set of 2 to 3 similar fans.

Preparation:
Sail Car bases need to be made before the activity. The same base can be used over and over; the sails just need to be removed before a new test is made. 5 bases can be used with up to 30 students at a time. Tracks and a starting line need to be taped on the floor. One fan in front of each track.
Station 2: Wind Powered Weight Lifter

Learning Goals:
This activity explores the concept of torque and how windmills do mechanical work. Students get excited about designing and testing windmill blades that have the surface area needed for the wind to push the blades and lift the most weights.

To understand how wind turbines work, one must first understand a basic windmill. This activity will help students understand how a windmill captures the energy of the wind and converts it into usable mechanical energy.

Time Frame:
Wind Powered Weight Lifter can be used as a walk-up or classroom activity. Learning time between 30 seconds and 45 minutes, depending on the time spent exploring how different variables affect efficiency (how many washers lifted).

Activity:
Students design and test wind turbine blade shape, size, material, angle, and number. Then they add washers to the bucket, a little at a time, until the windmill can no longer lift the bucket to the top of the axle. The number of washers demonstrates the efficiency of their blades.

Ages: 7-16+

Cost Per Student: $0.50

Materials: Paper plates, cardboard, chip board, glue guns/glue sticks for the classroom or Clip Hub for walk-up, scissors, pencils, rulers, 2 fans.