



Sail Car Extension Activities



Grade Level: For grades 4-5; adaptable for older students. Can be an individual assignment or completed in groups.

Background: The ability to design, test, evaluate, and improve is an important critical thinking and problem solving skill applicable to many situations beyond engineering. During the Early Engineers program students created a sail car out of recycled materials provided by the Marshall Steam Museum. This design is far from perfect and the next challenge is to determine a series of tests to evaluate the sail car and create solutions to improve its performance.

During this activity, students will:

- Design and execute a series of tests to evaluate their sail car design.
- Using the results of their tests, students will re-design or make specific changes to their sail car.
- Re-test their cars and determine whether their new design is an improvement or not, providing evidence to support their conclusions.

Student Activity Outline

Step 1: Test your Car

Design a series of tests (2-3 different tests) that will help you evaluate your sail car.

Examples: How could you test the speed of your sail car? Can you determine the fastest way to assemble the car? Can you test the cars durability or how long it will last? Will you test speed, durability, ease of assembly or something else? Record what happens during your tests.

Step 2: Re-design your Car

What could you change about the car that would make it perform better in the same tests? Would you change the materials? Would you change the design of the car? Would you change how you built it?

Step 3: Re-Test Your New Car

Perform the same tests as you did in Step 1 with your new design and record your observations.

Step 4: Draw Conclusions

Was your new design an improvement over the old one. Why or why not?

Standards

Common Core ELA: W4&5.2, W4&5.4, L4&5.1-3

NGSS: Energy: 4-PS3-4; Engineering Design: 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3



Sail Car Worksheet

Step 1: Test Your Car

Test 1

To test _____ I will: _____

Use this space to record what happened during your test:

Test 2

To test _____ I will: _____

Use this space to record what happened during your test:



Marshall Steam Museum

at Auburn Heights Preserve

Test 3

To test _____ I will: _____

Use this space to record what happened during your test:

Step 2: Re-design Your Car

Write or draw in the space below what changes you want to make to your car to improve how it performs during your tests.



Marshall Steam Museum

at Auburn Heights Preserve

Re-Test Your New Car

Perform the same tests on your car as you did in step one. Use the space below to record your results.

Test 1

Test 2

Test 3
