OVERVIEW

You will experiment with different types of material to make a sail for your Pitsco Try This: Engineering Kit Sail Car. You will experiment with different shapes to get the best performance from your sail car.

VOCABULARY

- distance
- inquiry
- sail
- trial
- variables
- wind source

MATERIALS

- 1/2" transparent tape
- Box fan
- Glue
- Hobby knife
- Hole punch
- Paper
- Pitsco Try This: Engineering Kit Sail Car
- Recyclables
- Scissors
- Stopwatch
- Tape measure

Recyclables could include pieces of material, foam board, cardboard, card stock, screen, or canvas – anything that can be used as a sail.

STUDENT PROCEDURE

1. Get into groups of four. You will receive your own sail car kit to build.
2. You will need to build the body of your sail car.
    A. The body must have:
        1. 4 wheels.
        2. A place to put the sail.
        3. A place where it can carry a load without interfering with the working of the car.
3. After you've built your sail car, you're ready to test. You will be testing two different things.
    A. First, you will determine what material works best as a sail.
    B. Second, you will experiment to find the best shape for the sail.
        1. Your sail car is successful if it meets the criteria for the construction of the car and size of the sail. Also, your sail car must travel at least 15 feet in 45 seconds using a box fan as its wind source.
4. In the recycle box, you should find a variety of materials that can be used to make the sails for the cars. Choose three or four different materials.
5. Record these materials in your Scientific Notebook. Define the problem as "I have to choose the best material and shape to propel a sail car."
6. Write a hypothesis on which material will work the best to propel your sail car. This will be the material that you will test last.
7. To test the material, you will need to attach it to your sail car. Use the box fan as your wind source to test the material. You will record observations on the "Sailing Away Sheet." A hole punch can be used to create holes for your sail to attach to your sail car.
8. You will need to do the same test with each material, making sure to attach it to the car the same way every time. You will perform a total of three tests testing different materials.

9. When you have reached a conclusion, record it in your notebook.
10. After you've chosen the material to propel your sail car, run tests to choose the best shape for the sail.
    A. Sails can be:
        1. Height: 3-6 inches
        2. Width: 3-6 inches
11. You will be given enough material to do three different shape tests. Record your hypothesis in your notebook. Sketch the shapes you are going to use.
12. Use the box fan as your wind source for testing. As you are testing, record the sail shape and your observations on the "Sailing Away Sheet."
13. Choose the best sail design. Attach it to your sail car to prepare for the final test. A hole punch can be used to create holes for your sail to attach to your sail car.
14. For the final test, take your car to your teacher. Your car will have 45 seconds to travel 15 feet to cross the finish line.

ACTIVITY CONNECTION

Scientists are looking to harness wind energy to create electricity to replace the use of nonrenewable resources. Use your classroom computer or tablet to research areas where wind turbines are being used. Construct a model of a wind farm. Write a paper about some of the progress that scientists have made. Share your opinions of the use of wind energy to power our homes and businesses.

SAILING AWAY SHEET

Name _____ Date _____

	Sail Material	Observations
Test 1		
Test 2		
Test 3		
	Sail Shape	**Observations**
Test 1		
Test 2		
Test 3		

SCIENTIFIC NOTEBOOK

Draw Conclusions	Scientific Notebook
8	Name: _____ Date: _____ Project Name: _____ _____ 1
Gather Materials What materials do you need? 5	**Create a Hypothesis** 4

This notebook is for your notes, ideas, observations, and results from problem solving like a scientist.

Remember, the scientific process involves the following steps:

1. Define the problem.
2. Create a hypothesis.
3. Gather materials.
4. Experiment.
5. Observe and record results.
6. Draw conclusions.

Have fun!
Be observant!
Think like a scientist!

Observe and Record Results

Define the Problem

Experiment

RUBRIC

Student Name _____ Date _____

Criteria	Yes	No
The sail car has four wheels.		
There is a place for a sail on the body of the car.		
The car can carry a load without trouble.		
The car has a sail made of material from the recycle box.		
The sail has a recognizable shape.		
The car traveled 15 feet in 45 seconds or less.		

Teacher Observations & Comments	