



PLTW Engineering

# 12/Design Challenge – Wind Powered Vehicle

May 14, 2020



**12/EDD**

**Lesson: 5/14/2020**

**Objective/Learning Target: Students will apply the design process to design and build an alternatively propelled vehicle.**



## Wind as an energy source

Wind is formed by differences in atmospheric air pressure, usually generated by the Sun.

Earth is heated unevenly, with warmer temperatures in places like the Bahamas and cooler temperatures in places like Antarctica.

Hot air rises while cooler air falls, and the push between heated and cooled air creates wind.



## Wind as an energy source

Even though wind is inconsistent, it's still a renewable energy source that will never run out.

Wind turbines harness the kinetic energy, or motion, of wind. A wind turbine is like a fan only it works in the opposite way.

Instead of using electricity to move, it makes electricity with the power of wind. Wind makes turbine blades rotate. The rotation spins a connected shaft inside a generator to create alternating current (AC) electricity.



## Define the problem

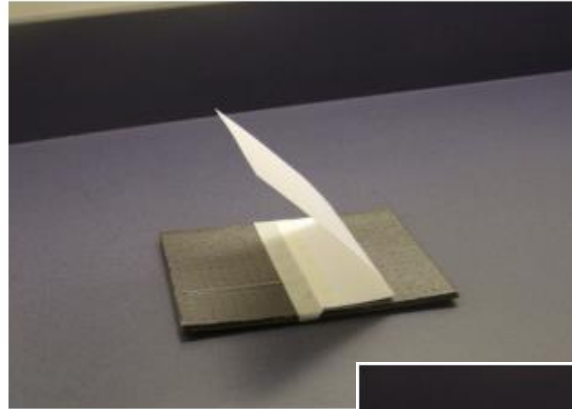
So as you can tell from the wind turbine. Wind is an abundant source of energy and can be used for power.

Today you will explore the design process with the goal of designing a testable wind powered vehicle prototype.

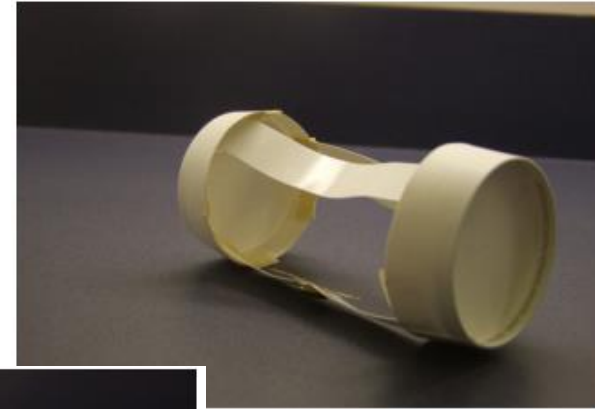
The challenge is to engineer a wind-powered vehicle that will move as far as possible with three puffs of air for power.

## Gather materials

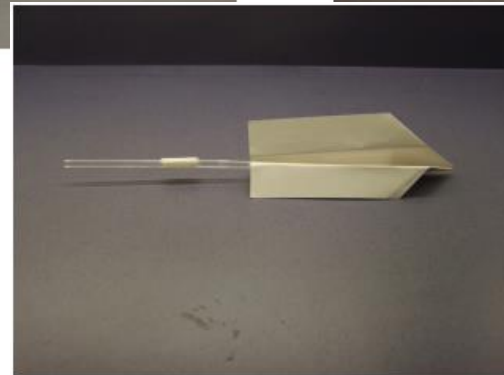
Foam trays  
Index cards  
Scissors  
Paper or foam cups  
Drinking straws  
Tape  
Ruler  
Craft sticks  
Plastic grocery bags  
Construction paper



Slide!



Roll!



Fly!

# Brainstorm

Use the internet to find different wind powered vehicles which are already in production.





## Design a solution and prototype

In what ways do the vehicles you found harness the wind power?

Do you think any of these ideas might work well? Why?

What ways you could use the materials you have to engineer a vehicle?

What are barriers to your design being completed successfully?





## Test prototype and communicate your results

After testing your prototype

What parts of your design are working well?

Which steps of the Engineering Design Process did you use?

What parts would you improve if you could design your vehicle again? Why

Which step of the Engineering Design Process help the most to solve the problem?

Why do you think it's important to use these steps?



## Helpful Links

[Wind powered car](#)

[DIY wind powered car](#)

[Wind powered toy car](#)