

Challenge #3 = Air-Powered Car

Problem: Make the car move forward across the length of the table using only air. You *cannot* use human breath.

Materials:

- 1 car
- 1 container of play-doh
- 1 fan
- batteries for fan

Plan 1 - *This is a well labeled sketch of what you think you are going to build.*

Prototype 1 - *This is an annotated photo of your first build.*

Test 1 - *Test your prototype and answer the questions below. Bullet points are fine!*

1. What was successful about your prototype?
2. What failed?

Evaluate 1 - *Answer the question below to analyze your test. 1 - 3 sentences ONLY.*

1. How would you change your design? Why?
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Plan 2 - *This is a well labeled sketch of what you think you are going to build.*

Prototype 2 - *This is an annotated photo of your first build.*

Test 2 - *Test your prototype and answer the questions below. Bullet points are fine!*

1. What was successful about your prototype?
2. What failed?

Evaluate 2 - *Answer the question below to analyze your test. 1 - 3 sentences ONLY.*

1. How would you change your design? Why?

CAN DO MORE DESIGN CYCLES IF NEEDED!

Implement - *Annotated photo of your final build and answer to the question below. 1 - 3 sentences ONLY for each question.*

1. If you could add materials, what would you add and how would this improve your design? Why?

Evidence

We are soon going to write a Claim-Evidence-Reasoning to explain how forces enable objects to move. The first thing we need to do is gather evidence!

1. Draw a force system diagram showing all the forces in the air-powered car the moment before air-powered car moves. Take a photo of this drawing and insert it here.
2. Draw a free body diagram showing the forces acting on the air-powered car when moving. Take a photo of this drawing and insert it here.
3. Using the force probes, find the force of the air-powered car. You should take at least 5 readings. Put these readings in a table below and use **the average as your final reading**.

Reading	Force of air-powered car
1	
2	
3	
4	
5	
Average	

4. Find the mass of your air-powered car and record it below. Hint: *What units do you want the mass to be in?*
5. Finally use Newton's 2nd Law to calculate the acceleration of the air-powered car. Please show your work.



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