

STEAM CHALLENGE

Define the Problem

An engineer's first design is rarely the best solution to a problem. When designing something as large as a space shuttle, engineers often make small models to test their designs. Your task is to build a model shuttle that can be successfully launched with a straw.



Constraints: Your model may only use one sheet of paper and tape.



Criteria: The paper shuttle must go at least 1 meter (1 yard) when launched by blowing through a straw.





Research and Brainstorm

What wing shape will work best? How many wings will work best? Where should the wings be placed? What forces are acting on your shuttle?



Design and Build

Sketch your design including measurements for each part of your model shuttle. Build the model.



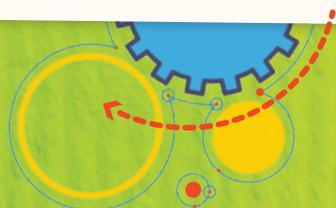
Test and Improve

Launch your paper shuttle from your straw three times. Did your shuttle go 1 m (1 yd.) or more? Did your shuttle design provide consistent results? Get feedback. Modify your design and try again.



Reflect and Share

What factors affected your shuttle's flight pattern? How can you minimize the effects of these factors? Will other types of materials improve the results?



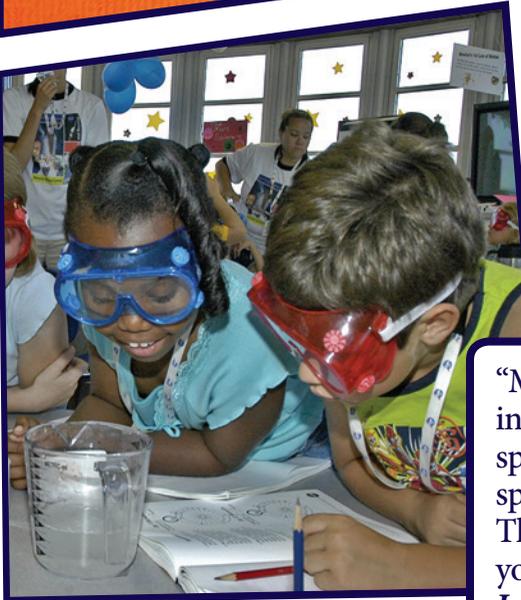
CAREER ADVICE

from Smithsonian



Do you want a career in space?
Here are some tips to get you started.

“NASA hires people with many different interests. I started out writing about science and technology for NASA. Whatever you like to do, there is a future space career for you!” —*Dr. Valerie Neal, Space History Curator*



“Museums are committed to teaching and inspiring students. Visit as many air and space museums as possible. Learn about spacecraft by listening to museum guides. They are experts in their field. They can help you find where your passion lies.” —*General John “Jack” Dailey, former National Air and Space Museum Director*

Read and Respond

1. How was gunpowder important in rocket technology?
2. Why was the space race important?
3. What are some challenges engineers faced when they designed the first space shuttle?
4. How would space travel be different if the space shuttle had never been invented?
5. Why do you think the program lasted so much longer than it was supposed to?
6. Design an improved space shuttle. Include details that show where the shuttle has been upgraded and how it is similar to the real space shuttle.

