

# Story time with a Scientist: Aerospace Engineering

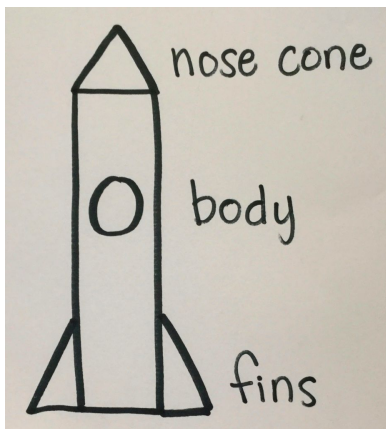
An aerospace engineer is someone who designs, creates, and tests spacecraft such as rockets. Enjoy this story about how birds, planes, and rockets fly then design your own rocket out of whatever materials you have at home.



## Aerospace Engineering

By Ruth Spiro and illustrated by Irene Chan

After listening to the story ([link to video](#))



1. Design or sketch your rocket (or [print one](#)).
2. Color it in. Add any details you'd like to include.



## Suggested Materials

- Paper
- Crayons or markers
- Scissors
- Glue or tape
- Toilet paper roll (or rolled up paper)
- String, yarn, or floss
- Straw (or rolled up paper)

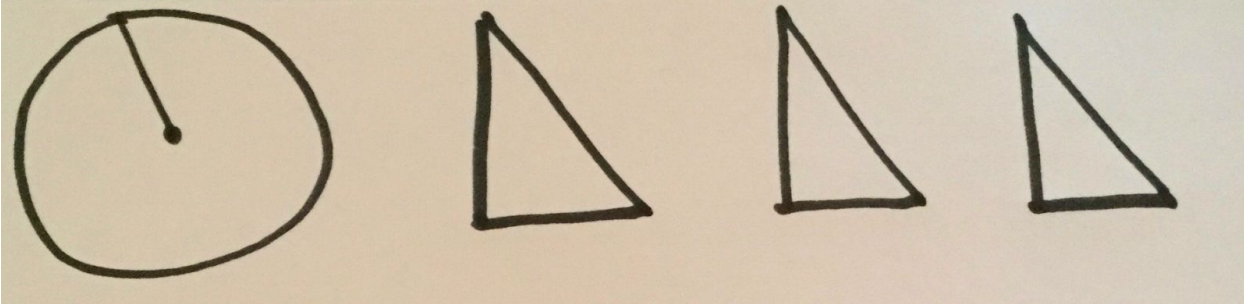
To learn more about rockets check out [NASA Rocketry](#)

Or notes or pro tips.

3. Create your 3D design.

*Nose cone:* Draw a circle. Dot in the middle then draw a line out (radius).

*Fins:* Draw 3 triangles.



Color them in then cut along the black lines.



4. To create the nose cone, cut to the center of the circle. Squeeze the two sides together to form a cone shape. Tape it to the top of your rocket body (toilet paper roll).

5. Tape on the fins and any other details you'd like to add to your rocket.

### Ready for Launch?

You've designed and created your rocket, now let's test it out. The safest "fuel" we can try at home is air.

How can you make the rocket move using air?

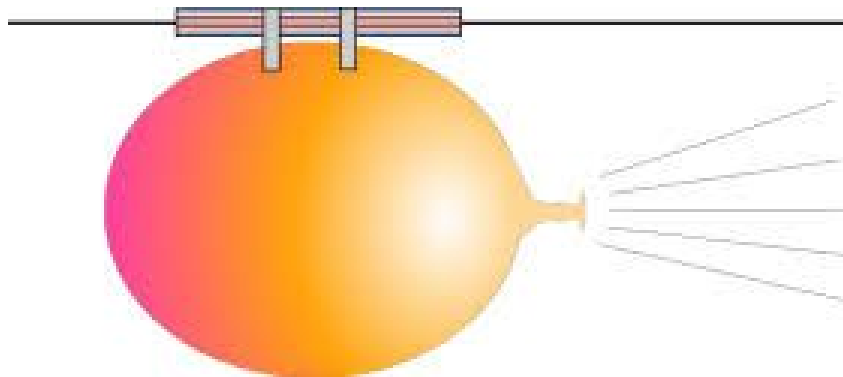
How else can you create thrust to move your rocket?

What else can you use? Can you use your body? Can you use a tool?

What did you notice while conducting these experiments?

Here's an idea to try:

- Grab some string or floss and tape one end to a wall.
- Tape a straw (or rolled up piece of paper) to your rocket.
- Feed the string through the straw.
- Can you launch your rocket just using your breath?
- What happens if you hold the string level?
- What happens if you angle the string?
- If you have a balloon, you could tape the straw to the balloon then inflating and launch it.



Share your rocket with us on social media at Chabot Space & Science Center! Facebook, Twitter, YouTube, Instagram

And don't forget to hang your sketch in your window to share with your neighbors.



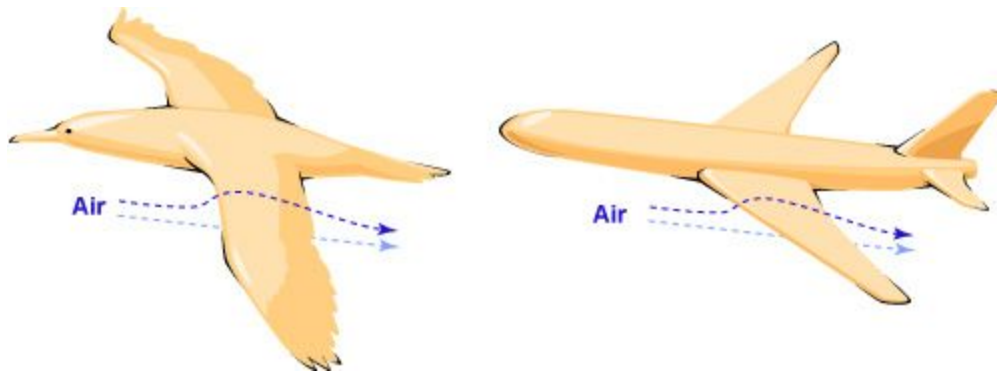
## How do birds fly?



When birds flap their wings, air is moving over and under their wings. This is called thrust. Birds have hollow bones and strong muscles, which are needed to create thrust. Thrust creates lift and gives both birds and planes the ability to fly.

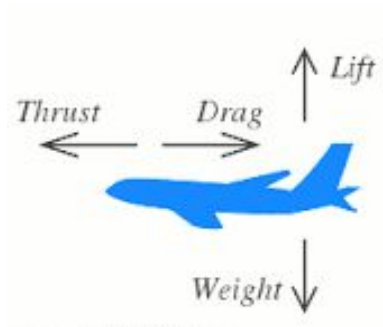
## How do planes fly?

Since planes can't flap their wings, they use engines for thrust.



Notice how similar in shape bird and plane wings are? This shape gives them lift once the engine has given them the thrust they need to fly. The air that passes over and underneath the wing lifts the plane as it combats gravity.

## How do rockets fly?



Planes can only go so high in Earth's atmosphere. The higher you go, the thinner the air is until you're in the vacuum of space.

Rockets need their engine to create enough thrust to exit the Earth's atmosphere. Plus, some rockets can weigh over 4 million lbs, so they need enough fuel and thrust to get off the ground.

