



Propellers

Like 49 +1 4 Tweet

by [Chris Woodford](#). Last updated: June 30, 2016.

If you want to move forward, you need to push backward; that fundamental law of physics was first described in the 18th century by Sir Isaac Newton and still holds true today. [Newton's third law of motion](#) (sometimes called "action and reaction") is not

always obvious, but it's the essence of anything that moves us through the world. When you're walking down the street, your feet push back against the sidewalk to move

you forward. In a car, it's the [wheels](#) that do something similar as their tires kick back

against the road. But what about [ships](#) and [planes](#) powered by propellers? They too use Newton's third law, because a propeller pulls or

pushes you forward by hurling a mass of air or [water](#) behind you. How exactly does it work? Why is it such a funny shape? Let's take a

[clear look!](#)



Newton's 3rd Law



"for every action there is an opposite but equal reaction" Ex) Push your foot back to get to move forward

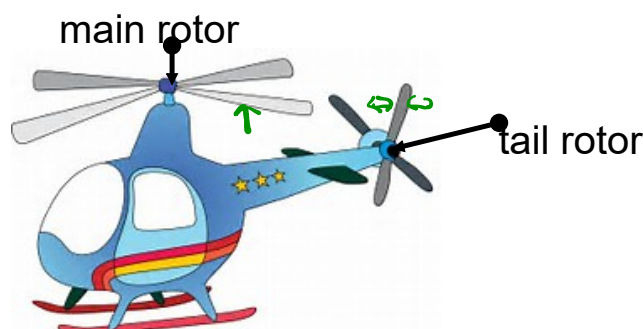
A propeller is a machine that moves you forward through a fluid (a liquid or gas) when you turn it. Though it works the same way as a screw, it looks a bit different: usually it has two, three, or four twisted blades (sometimes more) poking out at angles from a central hub spun around by an engine or motor. The twists and the angles are really important.



Helicopters



Helicopters can fly but they have no wings. Instead, a helicopter gets lift from spinning blades called "rotors" that are attached to the top of the helicopter. A second, smaller rotor called the tail rotor helps to keep the helicopter from spinning out of control.



Actually, if a person cut the rotor in half, you would see the same shape as a wing which is how the helicopter flies. (This main rotor allows a helicopter to fly straight up in the air without using a runway and to 'hover', remaining in the same place in the air without moving.)

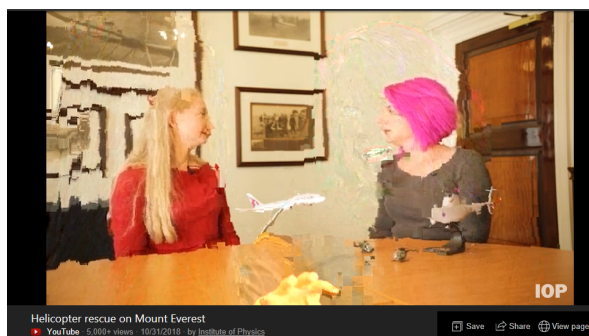
key definition

Being able to fly slow, hover and take off from a small place has made the helicopter useful for many jobs that airplanes cannot do. These include things like reporting on traffic conditions in big cities, lifting skiers to high mountain tops, uses in the logging industry, fighting forest fires and lifting heavy objects.

Helicopter logging video 7 min



RMR: Rick Goes Heli-Logging



Helicopter rescue on Mount Everest

YouTube 5,000+ views 10/31/2018 by Institute of Physics

Save Share View page

[https://www.bing.com/videos/search?q=helicopter
+rescue&&view=detail&mid=80646DF83DC45EF848D580646DF83DC45EF848
D5&&FORM=VRDGAR](https://www.bing.com/videos/search?q=helicopter+rescue&&view=detail&mid=80646DF83DC45EF848D580646DF83DC45EF848D5&&FORM=VRDGAR)





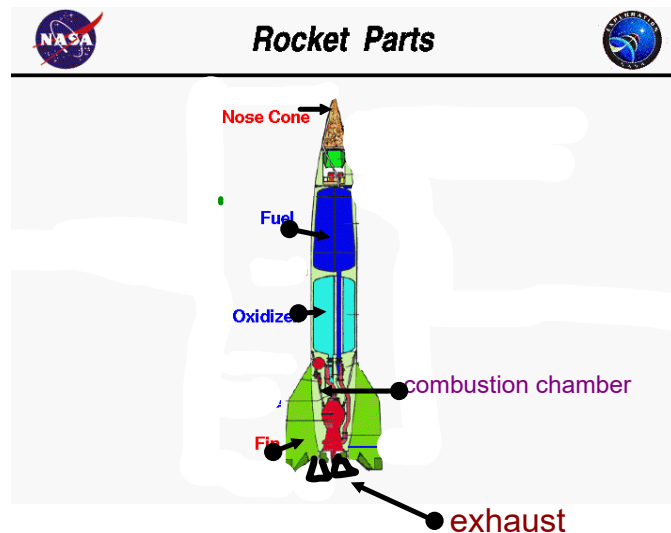
Propeller Design



Each fin of a propeller has an airfoil shape that is angled. The angle is the greatest toward the center because the speed of the propeller through the air is slower close to the hub. (The bend makes up for this)

The Rocket Works

Most rockets today are liquid fueled. They work by combining two liquids in a sealed chamber. When the liquids come into contact with each other, they burn violently, turning into explosive gases. These gases have no place to escape except out the back of the rocket through the nozzle. These gases pushing backwards causes the rocket to go forwards, following Newton's Third Law. Remember, it is the same as a person on a skateboard pushing backward on the ground to go forward.



Fins are used to keep the rocket moving straight.

Some rockets are multistage. meaning they have three separate rockets piled on one another. When the fuel in the bottom stage is used up, it separates from the rest of the rocket and discarded.

Since the rocket is now lighter it can go faster.

- Rockets have more than 2 gas tanks
- once one is used (at the bottom) then that part of the rocket breaks off
- Makes rocket lighter

