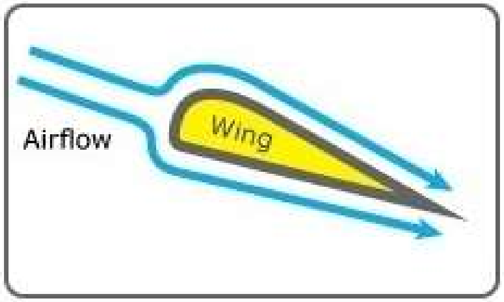
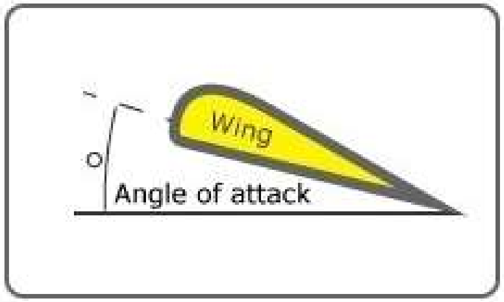
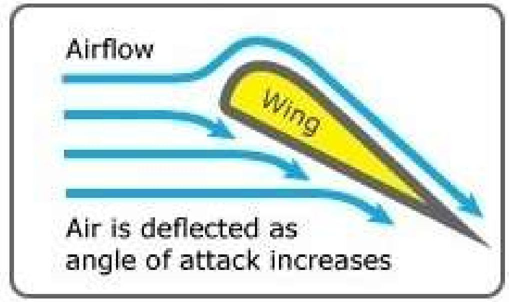
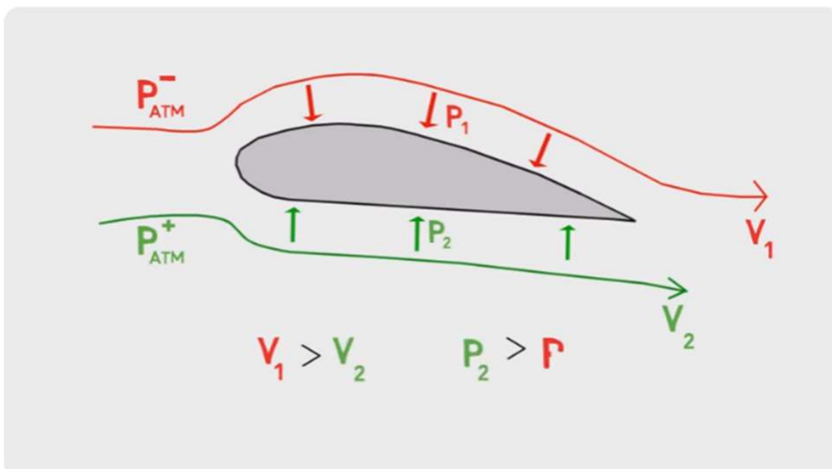
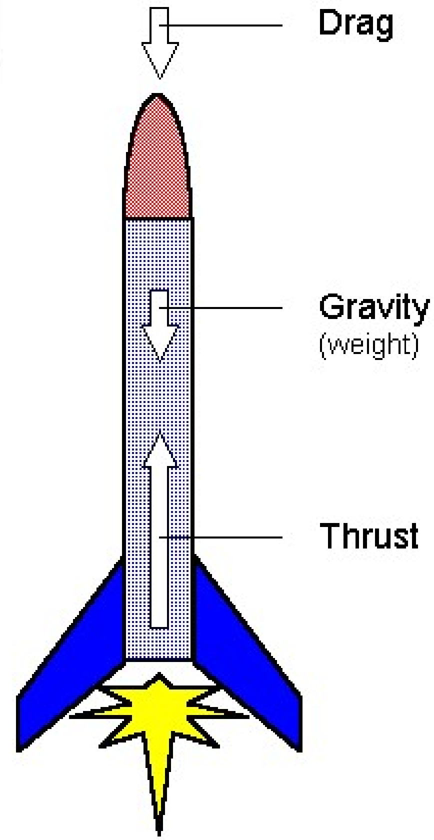


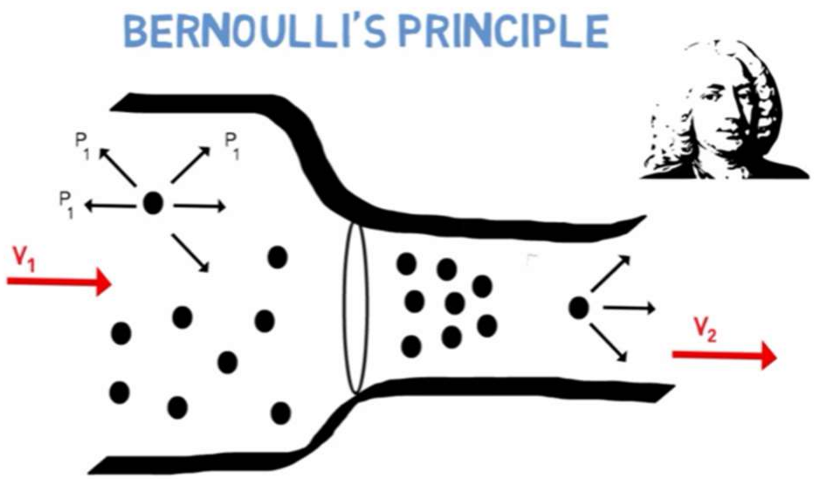




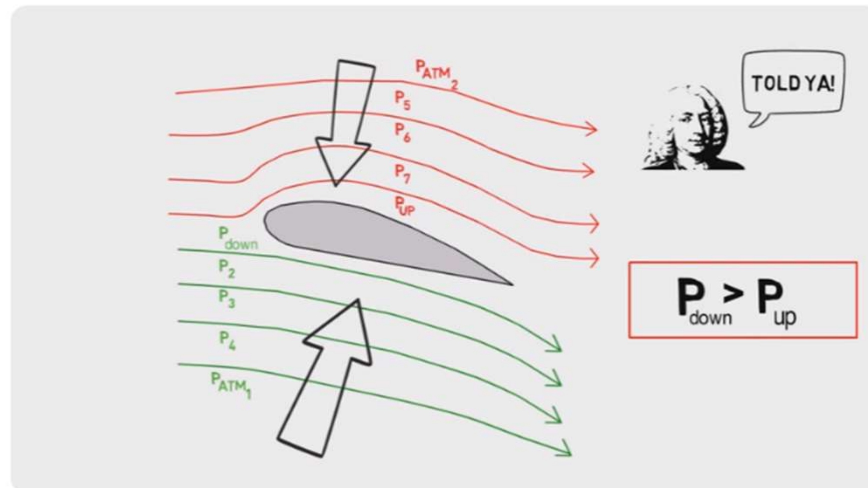


Part 2 - Coanda effect, Bernoulli's Principle and Lift

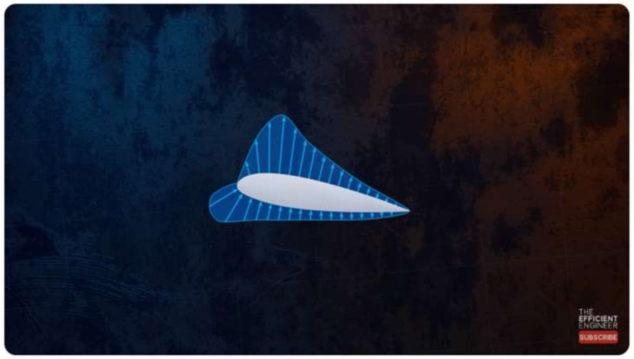




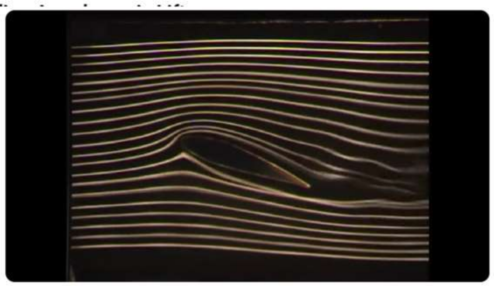
Part 2 - Coanda effect, Bernoulli's Principle and Lift

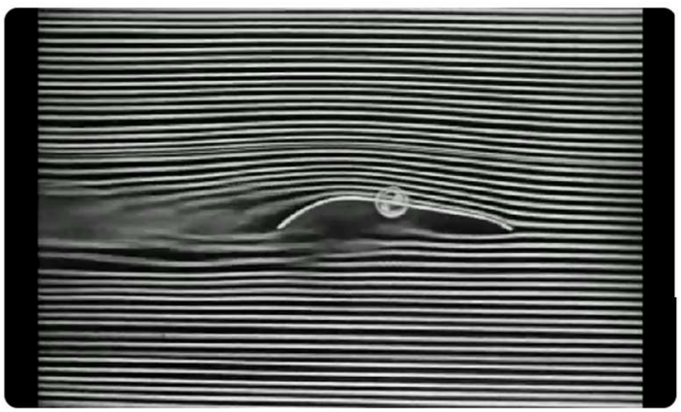


Part 2 - Coanda effect, Bernoulli's Principle and Lift



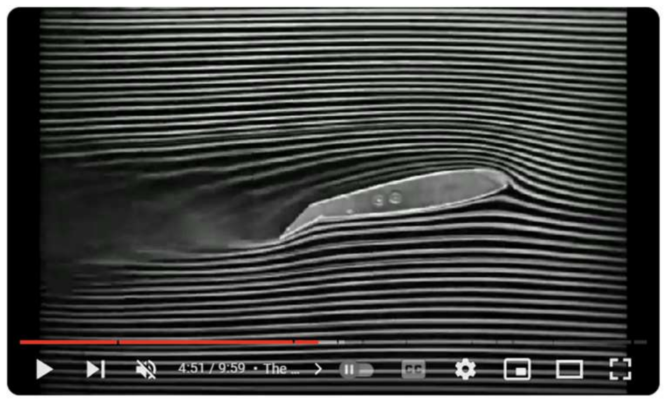
Understan



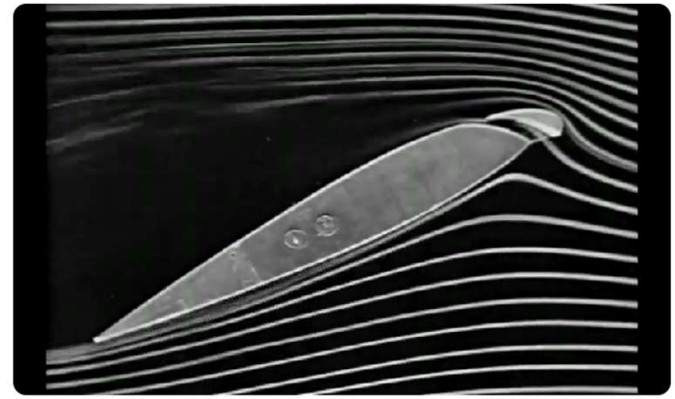


Aerodynamics | Pressure profile around airfoil

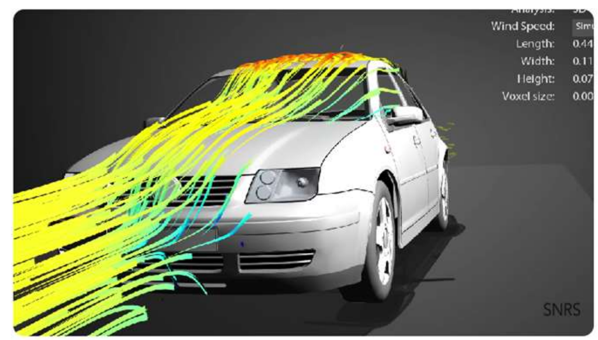
Aerodynamics | Pressure profile around airfoil



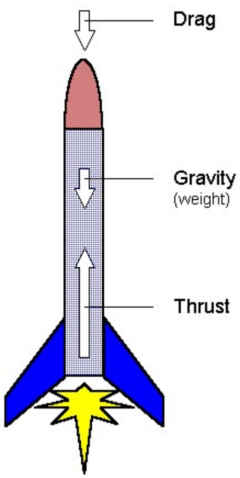
Aerodynamics | Pressure profile around airfoil



Aerodynamics | Pressure profile around airfoil



How do Vortex Generators Work?



- Time (T): the time this row represents. The first row starts at zero and for each row thereafter, T = T from previous row + dt.
- Mass (M): the mass of the rocket at this time. M = M from previous row - dM, where dM is the "mass decrement", or the mass of fuel you think will be burned in dt.
- Drag Force (Fd): Fd = 0.5*rho*Cd*A*V^2 where V is the velocity calculated in the previous row. Cd=drag coefficient, A=area of the rocket, rho=air density (1.2 kg/m^3 at sea level). Note: there's a little trick to drag force, see below.
- Thrust (Ft): Rocket's thrust. For example, you can set this to the average thrust for rows from time=0 up to the row that is the burnout time, zero thereafter.
- Net Force (F): F = Ft-Fd-M*g is the sum of thrust, drag, and weight.
- Acceleration (Acc): Acc = F/M, where force and mass values are the ones from this row (the current time

$$k = \frac{1}{2}\rho C_d A$$

$$q = \sqrt{\frac{T - mg}{k}}$$

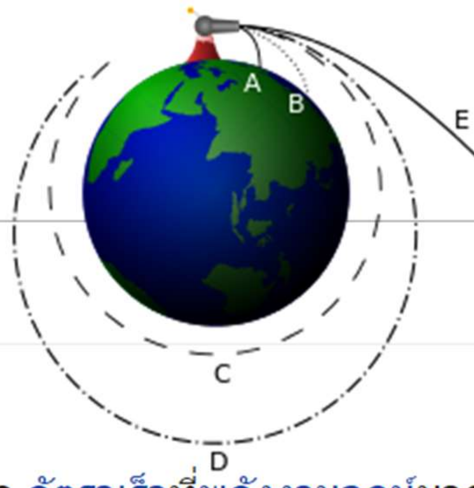
$$x = \frac{2kq}{m} = 2\frac{\sqrt{(T - mg)\cdot k}}{m}$$

$$t = \frac{I}{T}$$

$$v = q\frac{1 - e^{-xt}}{1 + e^{-xt}}$$

$$y_1 = \frac{-m}{2k}\ln\left(\frac{T - mg - kv^2}{T - mg}\right)$$

ความเร็วหลุดพ้น



บทความ อภิปราย

จากวิกิพีเดีย สารานุกรมเสรี

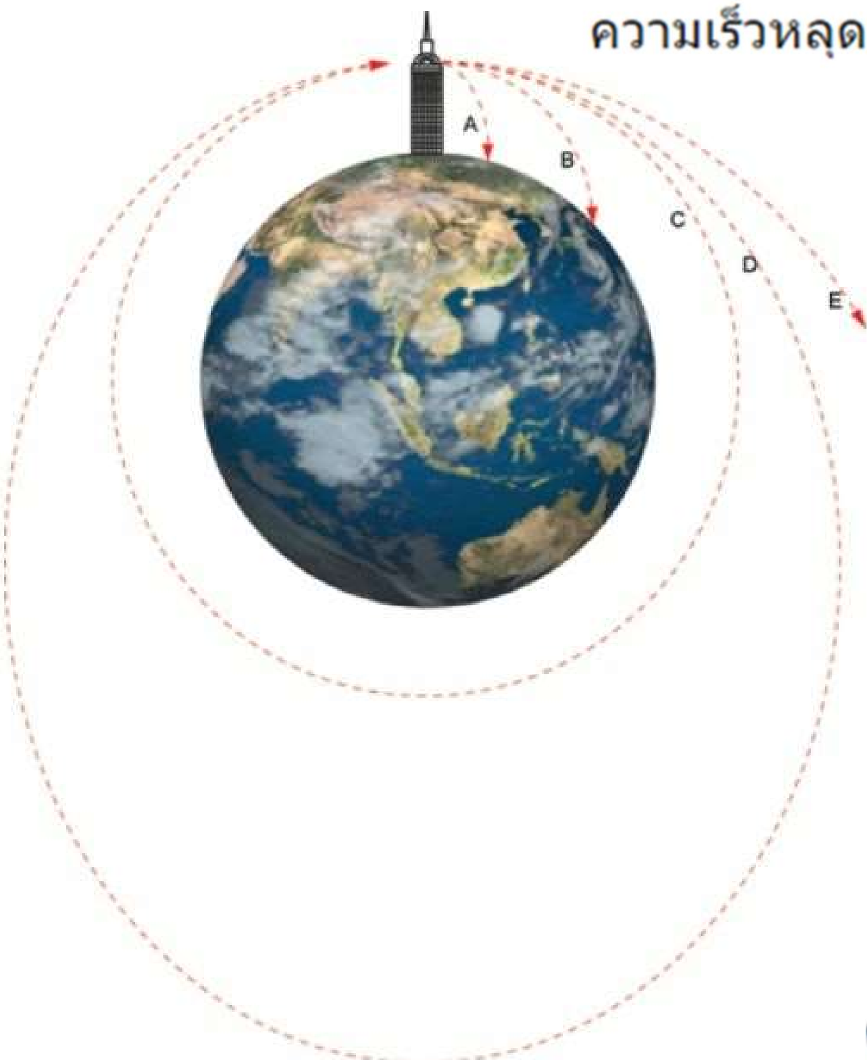
ในวิชาฟิสิกส์ **ความเร็วหลุดพ้น** คือ อัตราเร็วที่พลังงานจลน์บวกกับพลังงานศักย์โน้มถ่วงของวัตถุแล้วมีค่าเป็นศูนย์ [nb 1] **ความเร็วหลุดพ้น** คือ ความเร็วที่จะพาวัตถุไปได้ไกลจนพ้นจากอิทธิพลของแรงโน้มถ่วงของโลกได้พอดี ถ้าต้องการส่งยานอวกาศออกไปให้พ้นจากสนามโน้มถ่วงของโลก ต้องทำให้ยานอวกาศเคลื่อนที่ด้วยความเร็วมากกว่าความเร็วหลุดพ้น ความเร็วหลุดพ้นมีค่าประมาณ 11.2 km/s หรือ 40,320 km/h

สำหรับวัตถุทรงกลมสมมาตร ความเร็วหลุดพ้นที่ระยะทางค่าหนึ่งคำนวณได้จากสูตร [1]

$$v_e = \sqrt{\frac{2GM}{r}},$$

เมื่อ G คือ ค่าคงที่โน้มถ่วงสากล (the universal gravitational constant) ($G = 6.67 \times 10^{-11}\ \mathrm{m^3\ kg^{-1}\ s^{-2}}$), M คือ มวลของดาวเคราะห์, ดวงดาว หรือ วัตถุอื่น ๆ, และ r คือระยะทางจากศูนย์กลางของแรงโน้มถ่วง [nb 2]

ความเร็วหลุดพ้นมีค่าประมาณ 11.2 km/s หรือ 40,320 km/h

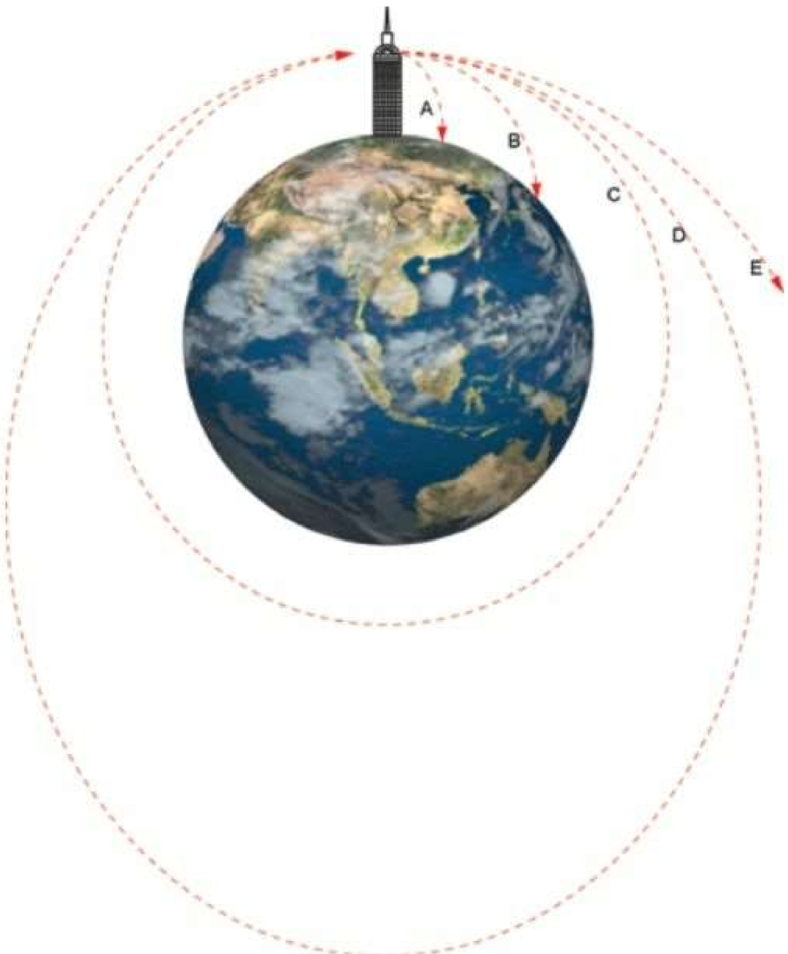


ความเร็วหลุดพ้น

$$v_e = \sqrt{\frac{2GM}{r}},$$

$$G = 6.67\times10^{-11}\ m^3\ kg^{-1}\ s^{-2}$$

https://www.sciencelearn.org.nz/embeds/132-rocket-launch-challenge


A
B
C
D
E


4
LAUNCH: CRS-12
1:20 / 10:48
Top 5 Amazing SpaceX Landings


FALCON HEAVY TEST FLIGHT
2:07 / 4:26
SpaceX Falcon Heavy- Elon Musk's Engineering Masterpiece


FALCON HEAVY TEST FLIGHT
1:11 / 4:26
SpaceX Falcon Heavy- Elon Musk's Engineering Masterpiece


LAUNCH: CRS-8
ENGINE CHILL
FALCON INTERNAL POWER
STARTUP
MAX-Q
DRAGON INTERNAL POWER
STRONGBACK
LIFTOFF
Top 5 Amazing SpaceX Landings


ที่มาของ
ความเร็วหลุดพ้น
(Escape Velocity)

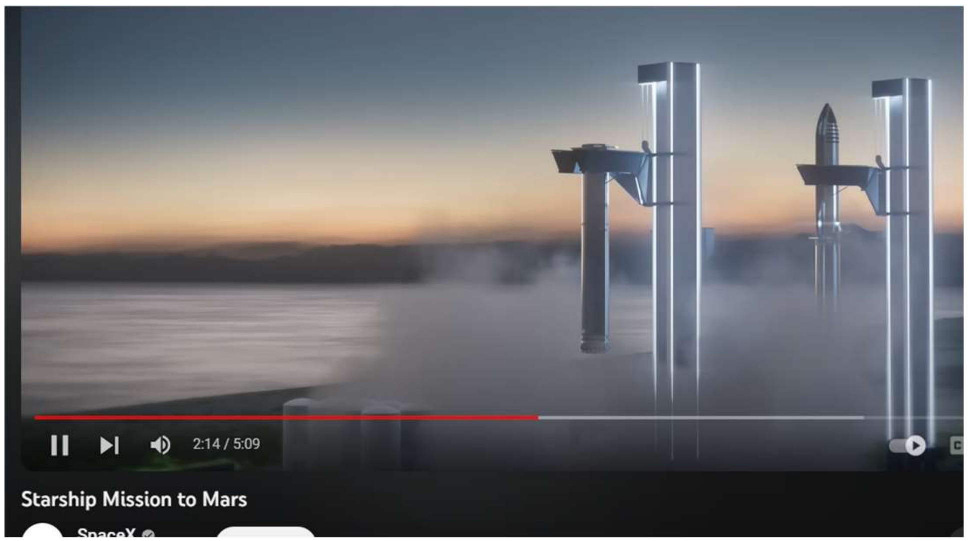
The evolution of SpaceX's Starship (with explosions!)

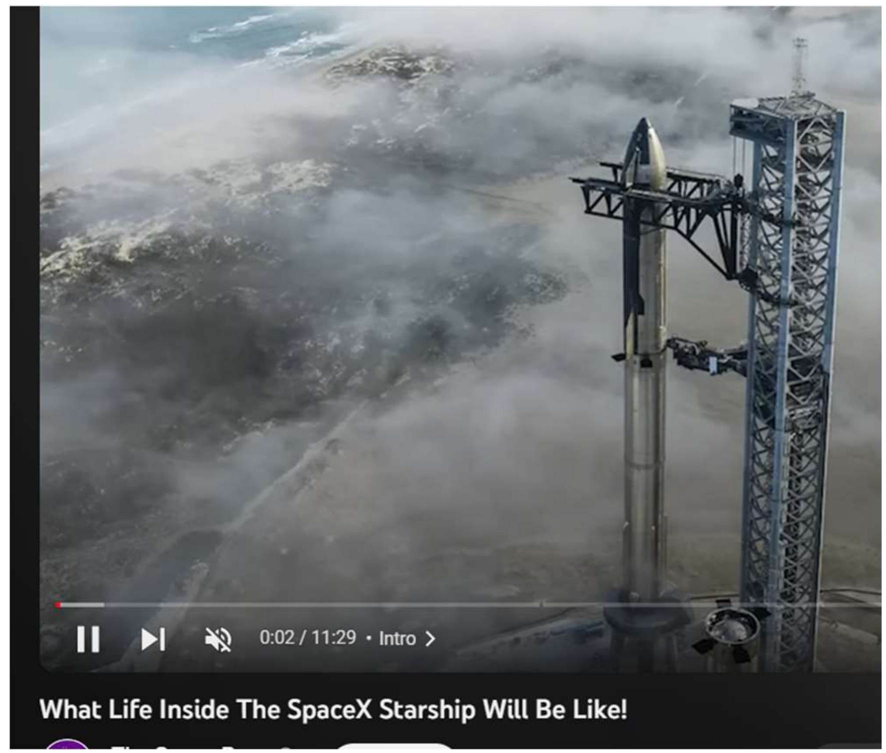
The evolution of SpaceX's Starship (with explosions!)

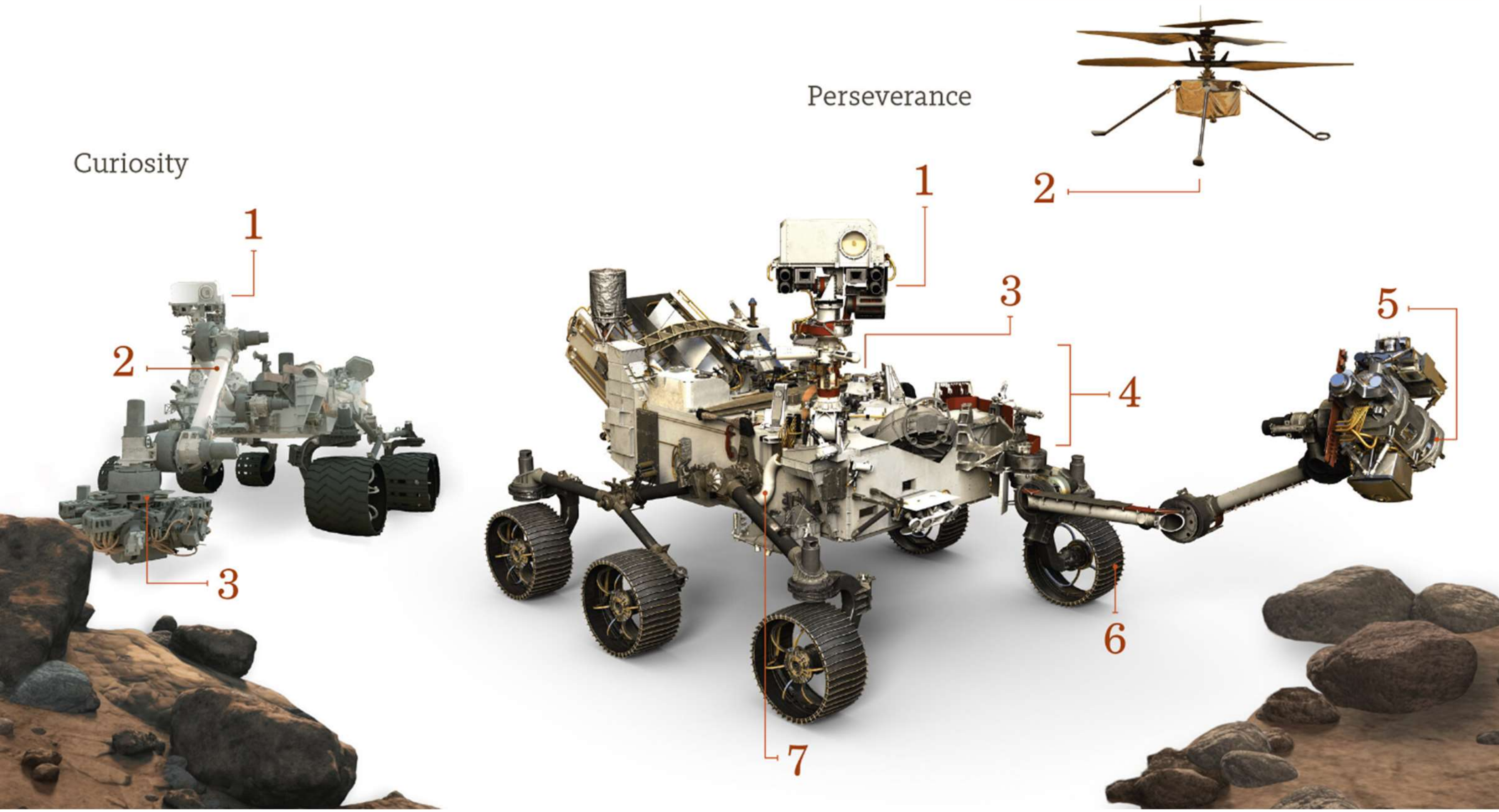
SpaceX Starship rocket blows up minutes after launch

NASA's SpaceX Crew-7 Flight Day 1 Highlights


NASA's SpaceX Crew-7 Flight Day 2 Highlights


2:14 / 5:09
Starship Mission to Mars


0:02 / 11:29 • Intro
What Life Inside The SpaceX Starship Will Be Like!


Perseverance
Curiosity
1
2
3
1
2
3
4
5
6
7

Design [edit]

The main components of *Ingenuity*

The lower gravity of Mars (about a third of Earth's) only partially offsets the thinness of the 95% carbon dioxide atmosphere of Mars,[39] making it much harder for an aircraft to generate adequate lift. The planet's atmospheric density is about $\frac{1}{100}$ that of Earth's at sea level, or about the same as 87,000 ft (27,000 m), an altitude never reached by existing helicopters. This density reduces even more in Martian winters. To keep *Ingenuity* aloft, its specially shaped blades of enlarged size must rotate between 2400 and 2900 rpm, or about 10 times faster[12] than what is needed on Earth.[40][41] The helicopter uses contra-rotating coaxial rotors about 1.2 m (4 ft) in diameter, each controlled by a separate swashplate that can affect both

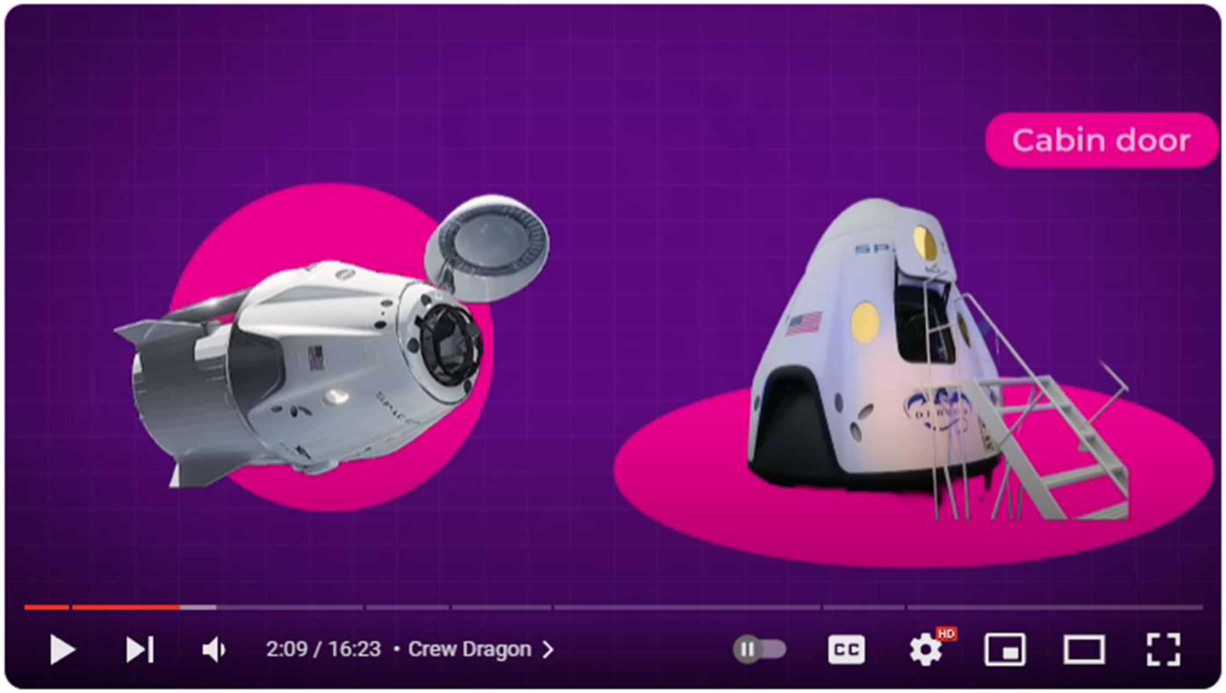
Flight characteristics of *Ingenuity*

Rotor speed	2400–2700 rpm[1][13][35]
Blade tip speed	<0.7 Mach[36]

Gravity of Mars

From Wikipedia, the free encyclopedia

The **gravity of Mars** is a natural phenomenon, due to the law of gravity, or gravitation, by which all things with mass around the planet Mars are brought towards it. It is weaker than Earth's gravity due to the planet's smaller mass. The average gravitational acceleration on Mars is 3.72076 ms^{-2} (about 38% of that of Earth) https://www.youtube.com/watch?v=1QcVa71FWQA



Life Inside The SpaceX Dragon Capsule!