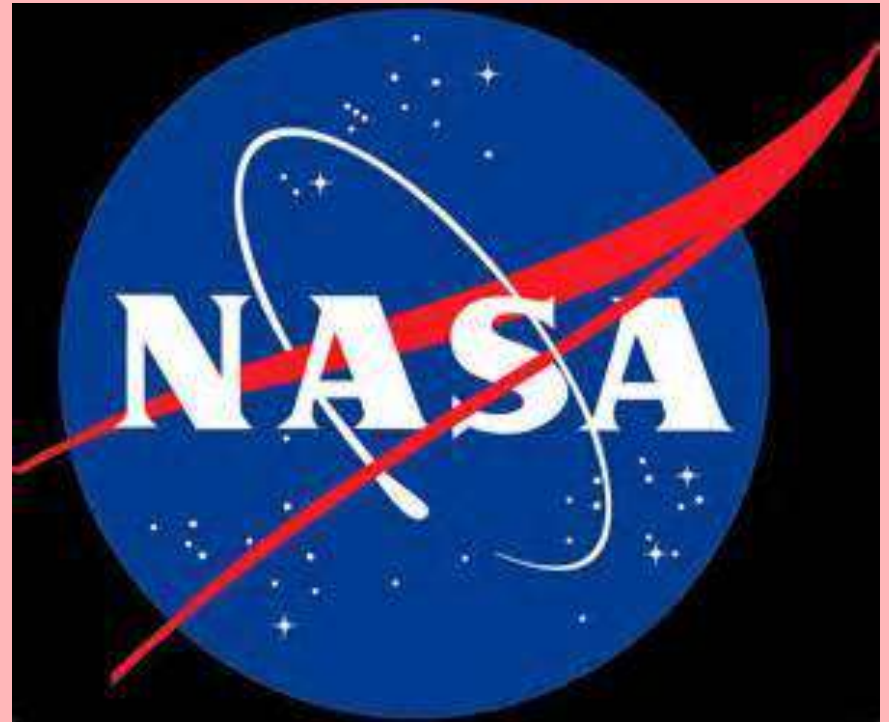


Why Space Travel?

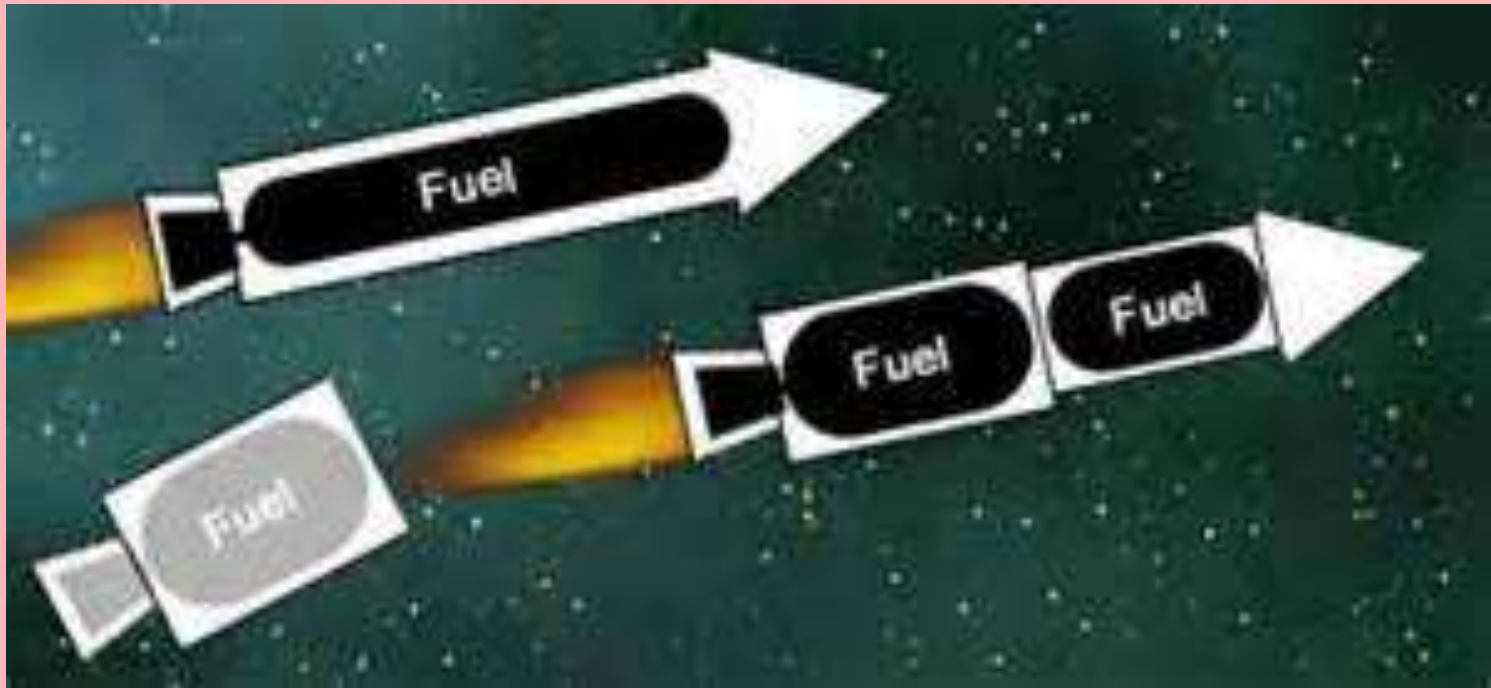
"I believe America should look to its future – and consider what that future will look like if we choose not to be a spacefaring nation."

**--NASA Administrator
Michael Griffin**



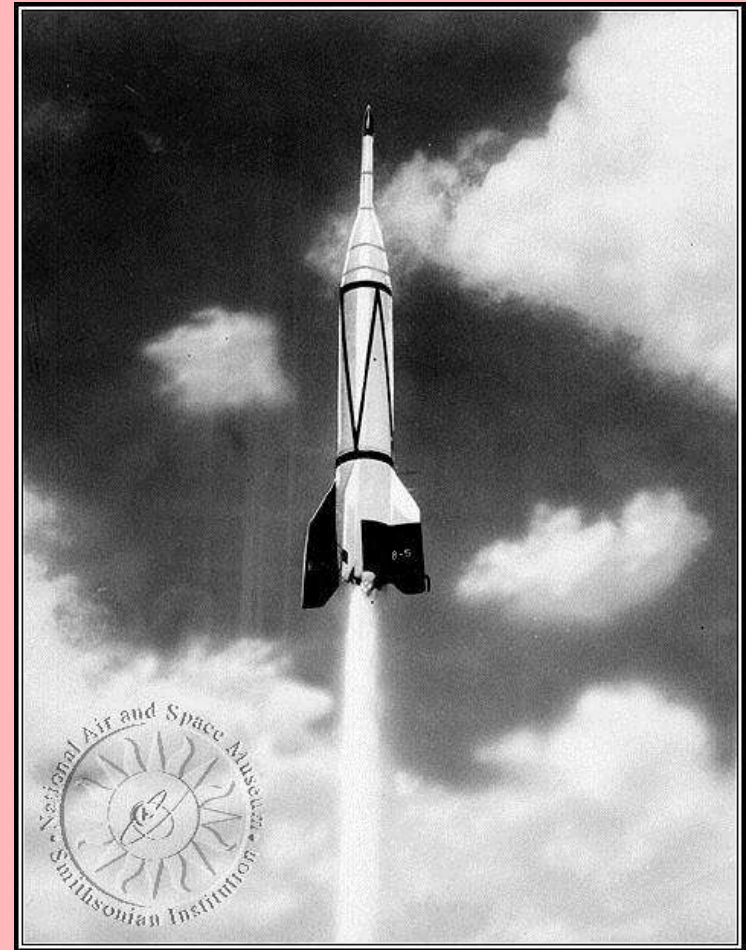
What is a rocket?

- A device that expels gas in one direction to move in the opposite direction.



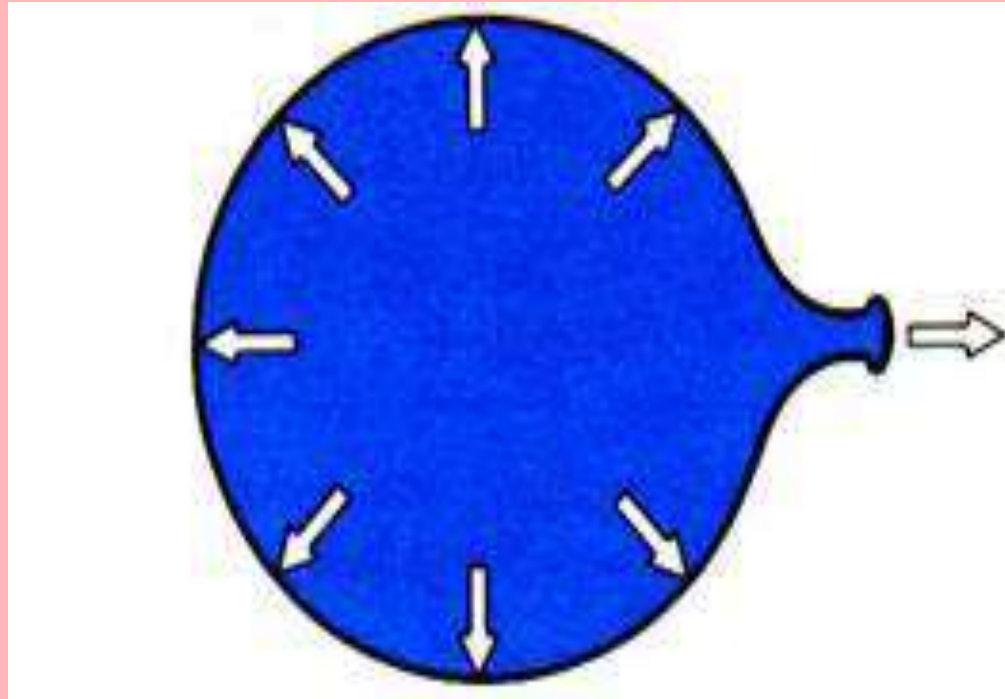
When were rockets developed?

- **Modern rockets were developed in the early 1900s.**
- **Russian physicists first described and designed them.**
- **Rocket designs advanced during WWII – Germans used V2 rockets.**

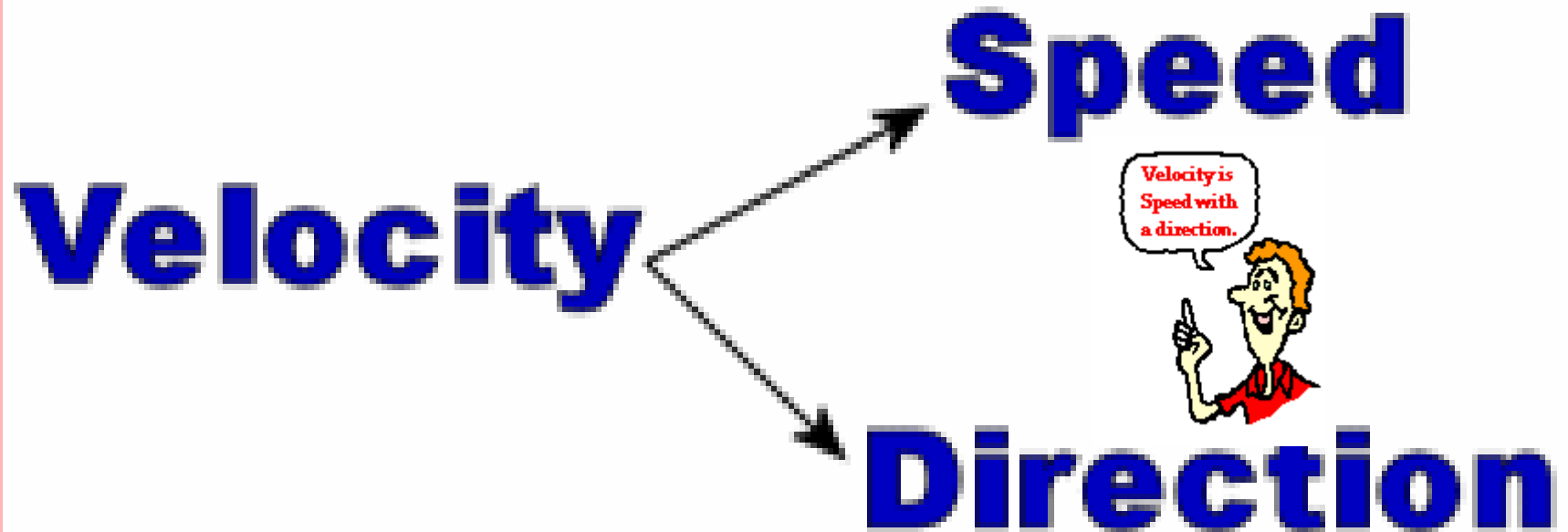


How does a rocket work?

- A rocket moves forward when gases shooting out the back of the rocket push it in the opposite direction.
- The **reaction** force that propels a rocket forward is called thrust.
- Bigger thrust = greater velocity



Revising Knowledge

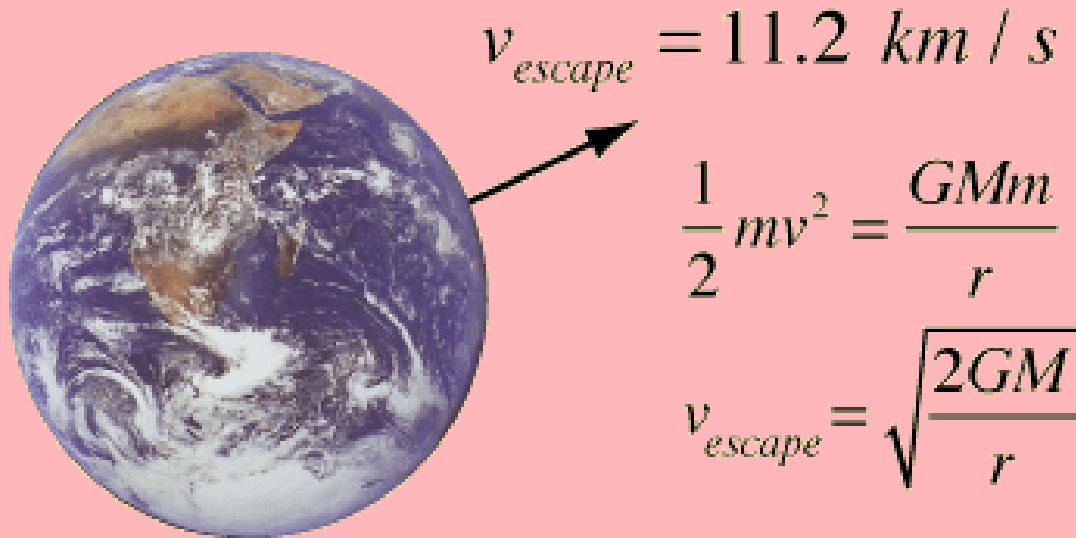


Acceleration

The **RATE** of **CHANGE** of **VELOCITY**

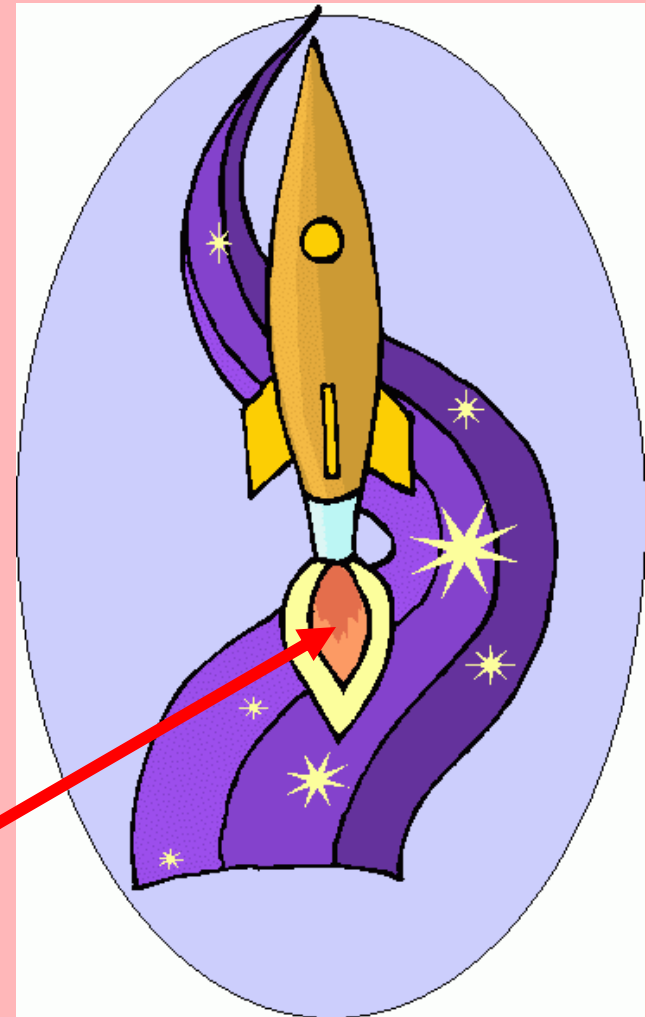
How much velocity is needed to escape Earth's Gravity?

- **Escape Velocity:** velocity needed to achieve orbit.
- To achieve orbit above planet Earth, a rocket needs to have an escape velocity of 11.2 km/s or 25,000 miles/hour.



How much velocity is needed to escape Earth's Gravity?

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NOT Fire!

How does a rocket carry enough fuel for escape velocity?

- The idea of the multistage rocket was proposed in 1903.
- The main advantage of a multistage rocket is that the total weight of the rocket is greatly reduced as the rocket rises.



<http://www.youtube.com/watch?v=Lflf05Y-rrk>

What was the space race?

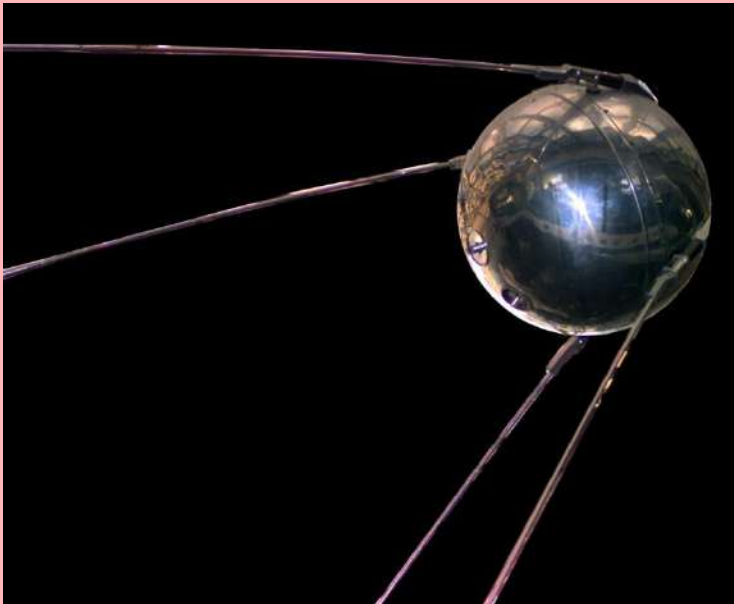
- For over a decade, the United States and the Soviet Union were engaged in a heated competition—the space race.
- The space race began in 1957 when the Soviet Union launched the first artificial satellite, Sputnik.
- Both countries wanted to win—to prove their scientific superiority and to show their military strength.

http://www.newseum.org/cybernewseum/exhibits/dateline_moon/space.htm



What is an artificial satellite?

- A man-made object that revolves around another object.
- Sputnik 1 (1957) and Explorer 1 (1958)



Between the launch of Sputnik in 1957 and 2008, around 6,000 satellites have been launched into orbit. This *computer-generated* photo shows all the junk orbiting Earth.

