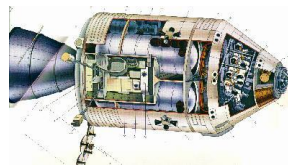
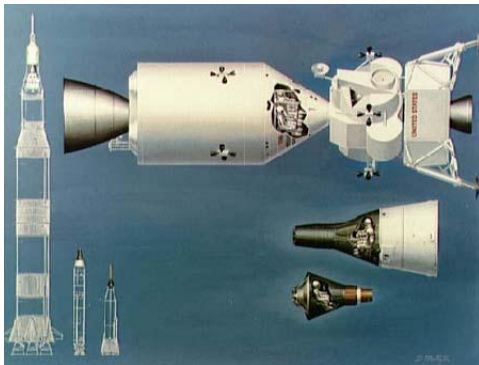


Manned Space Exploration

From Apollo to present

Project Apollo

- Purpose: Land on the moon & return safely to the Earth
- 3 Astronauts at a time



Apollo 1

- [Apollo 1 – Fire kills 3 Disaster](#): **Ed White, Roger Chaffee and Gus Grissom** die in launch pad fire while inside their Apollo 1 capsule. Fire was a result of 100% pure oxygen inside capsule, redesigned hatch that opened in instead of pushing out, and a short, a spark that ignited the fire.



Apollo 8 & 9

- [Apollo 8](#) - Jim Lovell was on board this flight and was the first manned orbital flight around the moon.
- [Apollo 9](#) - Earth orbit test of the LEM, Lunar Excursion Module, tested the descent engine, the ascent engine and docking procedures.



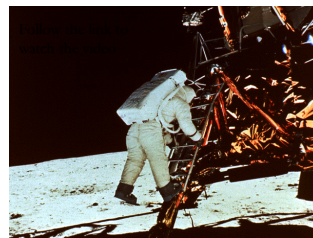
Apollo 10

- **Apollo 10**: Lunar orbital flight, Command module and LEM separate, LEM begins the descent to the lunar surface only to stop short and conduct a planned “abort”, never reaching the lunar surface.



Apollo 11

- **Apollo 11**: July 20, 1969 - First humans to walk on the moon:
 - a. **Neil Armstrong**: 1st to walk on the moon.
 - b. **Buzz Aldrin**: 2nd to walk on the moon, took communion on the lunar surface.
 - c. **Michael Collins**, remained in lunar orbit onboard the Command Module



Apollo 12

- **Apollo 12:** 2nd flight to the moon. Saturn V rocket struck by lightning a few moments after liftoff.
- a. **Pete Conrad:** Commander – 3rd man on moon
- b. **Alan Bean:** LEM Pilot. – 4th man on moon
- c. **Dick Gordon,** remained in lunar orbit onboard the Command Module



Apollo 13

- Major malfunction, explosion in the oxygen tank in the service module causes this near disaster.
- Jim Lovell, Fred Haise and Jack Swagirt were on board.
- Ken Mattingly was bumped by Swagirt two days before the flight because he was exposed to the measles.



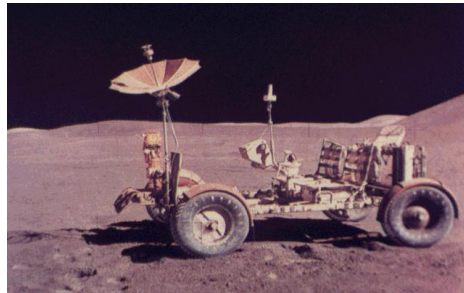
Lovell, Mattingly & Haise before launch



Haise, Swagirt & Lovell after landing

Apollo 17

- Lunar rover
- Launch of the LEM from the moon
- Gene Cerrin – last man on the moon



The Parts of the Shuttle

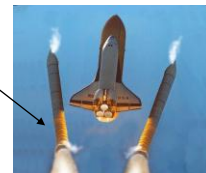
- **Orbiter** – the reusable spacecraft that glides back to Cape Canaveral to be used over and over again.
- **SRB's – Solid Rocket Boosters** – used to help propel the orbiter into orbit. Once the fuel is exhausted, they are released and parachute back to the Atlantic ocean and reused.
- **External Fuel Tank** – only part that is not reusable – it falls back to the earth, burning in the atmosphere.

There have been 5 Orbiters:

1. Columbia
2. Challenger
3. Discovery
4. Endeavor
5. Atlantis



Follow the links to watch the video



Shuttle Disasters

- **Challenger** was destroyed by faulty “O-ring” on the solid rocket booster during a cold winter launch. Flames burned through the SRB and ignited the external fuel tank causing catastrophic explosion killing all aboard, including **Kristy McCauliff**, the first “teacher” to be selected to enter space.
- January 2003, **Columbia** sustained damage to the orbiter wing from foam falling from External fuel tank on take off. Not realizing the problem in time, the orbiter disintegrated during reentry killing all on board.



ISS – International Space Station



- [Atlantis docked to the International Space Station](#)

We are done w/ the US manned space
program!!

TTFN!!!