

# Space X expedition

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Developments in space technology are reaching new heights. With a future plan of sending humans to live on Mars, the new Space X launch is one such milestone. It is required to know the facts about the stage by age development of space shuttles, mainly from prelims point of view.

**In news** SpaceX has launched two astronauts to orbit

**Placing it in syllabus** Space mission

**Dimensions**

- Space shuttles
- SpaceX expedition

**Content**Space shuttles:

- Space shuttle, **also called Space Transportation System**, is a **partially reusable rocket-launched vehicle** designed to go into orbit around Earth and to transport people and cargo to and from orbiting spacecraft.
- It was **developed by NASA** of the USA.
- It lifted off into space for the first time on **April 12, 1981** and made 135 flights until the **program ended in 2011**.
- NASA began work on an Integrated Launch and Re-entry Vehicle (ILRV) in 1968, and by 1969 the space shuttle's development received approval from then-President Richard Nixon.
- The **original vision of the space shuttle program was to develop a vehicle that would launch into space very frequently (several times a month) to deploy and repair satellites as required.**

The shuttle program had **five space shuttles:**

1. **Columbia (1981-2003):** This was the first space shuttle to fly in space. Operational missions began in 1982.

Some of its major mission activities included **Spacelab, deploying the Chandra X-Ray Observatory and servicing the Hubble Space Telescope**. In 2003 during landing the shuttle broke up in the atmosphere, killing its seven-person crew.

2. **Challenger (1983-1986)**: Challenger was originally constructed as a test vehicle and then was upgraded for spaceflight. Its major mission milestones included launching the **first Tracking and Data Relay Satellite, flying the first American female astronaut (Sally Ride), flying the first African-American (Guion Bluford) and the first astronaut repair of a satellite** (the Solar Maximum Mission satellite). The shuttle exploded on Jan. 28, 1986, killing all seven astronauts on board.
3. **Discovery (1984-2011)**: It flew 39 missions and some of the major payloads it released included the **Hubble Space Telescope**, the sun-bound Ulysses spacecraft and the Upper Atmosphere Research Satellite. It flew Mercury astronaut John Glenn at age 77, making him the oldest person to fly in space to date. Discovery was also the first shuttle to fly "return to flight" missions after both the Challenger and Columbia disasters. It was decommissioned after its last flight in 2011.
4. **Atlantis (1985-2011)**: The first mission of this shuttle was a secret military mission in 1985. Some of its other activities included launching the Magellan spacecraft toward Venus, launching the Galileo probe toward Jupiter, flying most of the missions of the shuttle-Mir program and flying the last space shuttle mission (STS-135 in 2011).
5. **Endeavour (1992-2011)**: Endeavour was constructed out of spare parts from other space shuttles, as a replacement for the Challenger space shuttle that exploded in 1986. During Endeavour's first mission in 1992, crewmembers performed the first three-person spacewalk. It was the first shuttle to participate in assembly of the International Space Station.

## SpaceX expedition:

- **SpaceX, a private company of the USA**, for the first time, launched two astronauts **Robert L. Behnken and Douglas O. Hurley** into orbit.
- It was the first launch of NASA astronauts from the United States since the retirement of the space shuttles in 2011.
- Since 2011, NASA's astronauts have had to travel to Russia and train on the country's Soyuz spacecraft which cost heavy for NASA.
- **In 2014, NASA awarded a \$2.6 billion contract to SpaceX**, which planned to create a crew worthy version of the Dragon spacecraft that was already flying cargo to and from the International Space Station.
- The **Falcon 9 rocket carried a Crew Dragon capsule** and lifted off from **"39A" launch pad** of Florida's Kennedy Space Center.
- The two astronauts have been trained to fly the **Crew Dragon capsule, which is only the fifth spacecraft design, after the Mercury, Gemini, Apollo, and Space Shuttle vehicles that NASA has certified as safe enough for humans.**

### ***About Crew Dragon:***

- It's a **gumdrop-shaped capsule**, about 13 feet in diameter and is **equipped with seven seats** and touchscreen controls.
- It is **fully autonomous**, so that the astronauts just need to monitor the systems and keep in touch with mission control.
- It is also **equipped with a unique emergency abort system** designed to jettison astronauts to safety if something goes wrong.
- According to a 2019 report from NASA's Office of the Inspector General, the Crew Dragon seats will cost NASA about \$55 million each.

One of **SpaceX's main goals is to bring down the costs of launching objects into space by reusing hardware.** E.g. Dragon capsules that fly cargo, have been used up to three times. And since 2015, SpaceX has managed to safely land a Falcon 9's first-stage booster, dozens of times.

SpaceX would attempt to recover the recent rocket's first-stage booster by landing it on a seafaring drone ship after launch. SpaceX's most ambitious reuse efforts will be with **Starship – a very large spacecraft currently in the early stages of development.**

**Mould your thought** Brief about the history of space shuttles. How is the recent SpaceX expedition a game changer for NASA?