


# Space Shuttle Worksheets

NAME: \_\_\_\_\_




## GALACTIC GLOSSARY

Astronomy is the scientific study of celestial objects and phenomena that originate outside the Earth's Atmosphere. In order to gain a first-hand understanding of space, astronauts or cosmonauts are being sent out to experience what it means to leave the safety of Earth.

**SCIENTIFIC TERMS.** These are some of the terms from the facts you might need to understand in order to move on in the activities.  
Circle the correct answer related to our topic.

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## SUPPORT CREW

The crews of the International Space Station and the Space Shuttle have inspired many people to pursue careers as astronauts. There's no disputing that these jobs are exciting high profile positions that bring plenty of recognition. The astronaut will be the first to tell you that their jobs would be impossible without thousands of support people who work hard to make astronauts' jobs easy.


**SUPPORT PEOPLE.** Match the job to its description. Of course there are more jobs available aside from these, so you might one be part of the NASA team one day!

**Instrumentation and Communications Officer, Propulsion Engineer, Spacecraft Communicator, Public Affairs Officer, Flight Director, Flight Dynamics Officer, Data Processing System Engineer, Electrical Generation and Illumination Engineer, Flight Activities Officer, Payloads Officer, Electrical, Environmental and Consumables Manager**

- \_\_\_\_\_ Responsible for overall Shuttle mission payload operations.
- \_\_\_\_\_ Communications link between flight controller and astronauts.
- \_\_\_\_\_ Pronounced "fido" - plans maneuvering trajectory.
- \_\_\_\_\_ Monitors the data processing system computers.
- \_\_\_\_\_ Monitors reaction control and maneuvering propellants.
- \_\_\_\_\_ Monitors electrical systems.
- \_\_\_\_\_ Plans crew activities.
- \_\_\_\_\_ Coordinates activities involving the payload.
- \_\_\_\_\_ Provides commentary and mission information to the media and public.
- \_\_\_\_\_ Responsible for passive and active controls of the vehicle, cabin atmosphere, supply system detection.
- \_\_\_\_\_ Monitors in-flight communication instrumentation systems.

[https://www.nasa.gov/audience/foreducators/4-features/E\\_People\\_Behind\\_the\\_Astronauts/](https://www.nasa.gov/audience/foreducators/4-features/E_People_Behind_the_Astronauts/)

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## THE SHUTTLES

In 2004, U.S. President George W. Bush announced the space shuttles would be retired. The final flight came to a close when Atlantis touched down at Kennedy Space Center on July 21, 2011.

There were 5 space shuttles sent to space. Cut and paste their pictures on the boxes. How did their technology evolve over the years?

On Dec. 21, 1968, the Apollo program's second manned spaceflight lifted off from Earth to orbit the moon.



Source: William Anders/NASA via AP

**COLUMBIA**

**CHALLENGER**

**DISCOVERY**

**ATLANTIS**

**ENDEAVOUR**

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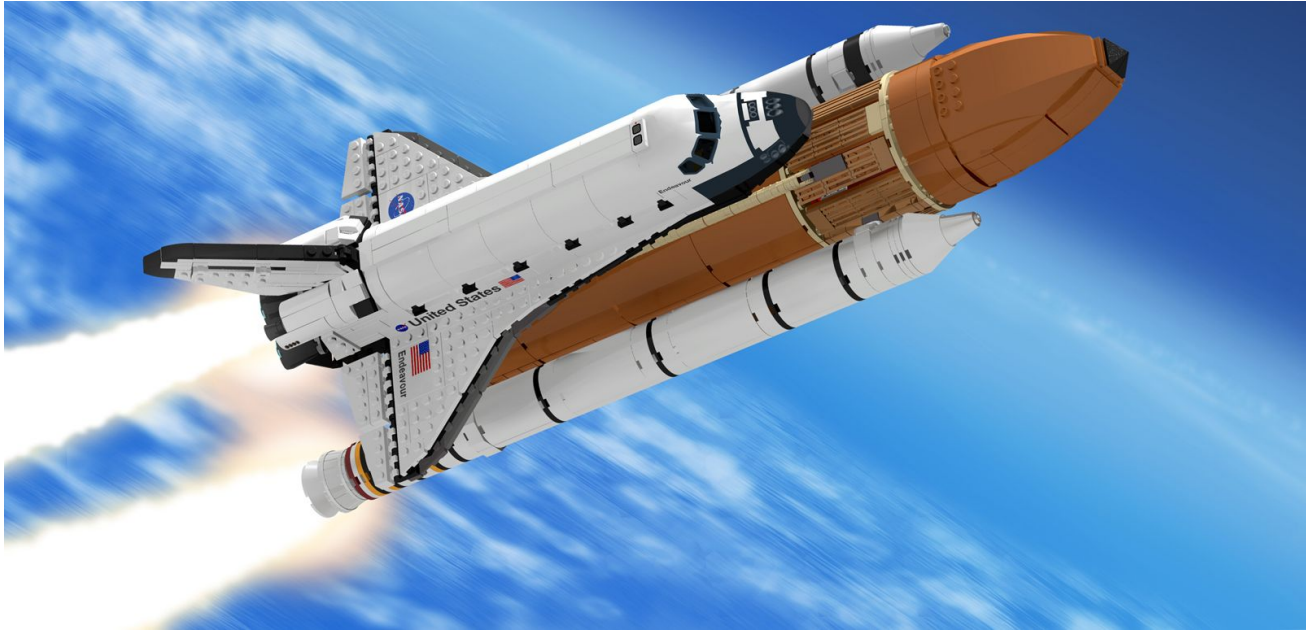
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- Ryan, Beth & Nicola :)

# SPACE SHUTTLE



**The Space Shuttle was a spacecraft which was used by the American National Aeronautics and Space Administration, or NASA. Space Shuttles were used to carry astronauts and cargo into space.**

## NASA

- The National Aeronautics and Space Administration (NASA) is an agency of the United States focusing on civilian space programs, as well as aeronautics and aerospace research.
- Established in 1958, most US space exploration efforts have been led by NASA, including the **Apollo Moon landing missions**, the **Skylab space station**, and the **Space Shuttle**.
- From 1961-1966, it first developed Project Gemini, which was created to develop long-duration flights, developing space rendezvous techniques, and precision Earth landings.



# SPACE SHUTTLE FACTS

- After extensive explorations and calculations, the Apollo Program was implemented from 1961 to 1972.
- Its primary mission was to land a man on the Moon by the end of the 1960s.
- 12 Astronauts walked on the moon after 11 successful spaceflight missions.
- From 1965 to 1979, the US built a space station called the Skylab. It orbited the earth for 2,249 days.
- The Space Shuttle then became the major focus of NASA in the late 1970s and the 1980s.



Project Gemini Spacecraft



Apollo Program landed man on the moon



The Skylab before its re-entry to earth

## THE SPACE SHUTTLE ERA

- The Space Shuttle era began in the 1980's.
- John Young and Robert Crippen launched the space shuttle program on April 12, 1981 by piloting Columbia to space and returning successfully two days later.
- Space Shuttle Columbia was the first ship in the NASA fleet. It completed 27 missions.
- Starting with **Columbia** and continuing with **Challenger**, **Discovery**, **Atlantis**, and **Endeavour**, the spacecraft has carried people into orbit repeatedly, launched, recovered, and repaired satellites, conducted cutting-edge research, and built the International Space Station.



# SPACE SHUTTLE **FACTS**

- The space shuttle did many things. It could carry up to seven astronauts at a time.
- It took satellites to space so they could orbit Earth. The shuttle carried large parts into space to build the International Space Station.
- The space shuttle was also like a science lab. Astronauts did experiments there. Doing experiments in space is different than doing them on Earth.
- By 2010, it is reported that the project cost US\$209 billion with about US\$450 million each mission.
- Each time a space shuttle launched, it was called a mission. The space shuttle launched for 135 missions.
- Each mission lasted for one or two weeks. The first mission was in 1981. The last mission was in 2011.
- The final space shuttle mission, STS-135, ended July 21, 2011 when Atlantis rolled to a stop at its home port, NASA's Kennedy Space Center in Florida.



Pictured in the STS-135 crew portrait are NASA astronauts Chris Ferguson (center right), commander; Doug Hurley (center left), pilot; Rex Walheim and Sandy Magnus, both mission specialists.

*Image credit: NASA*

## THE SPACE SHUTTLE

- It takes only 8 minutes for the Space Shuttle to accelerate to a speed of more than 17,000 miles per hour. The liftoff weight of the space shuttle is 4.5 million pounds.
- The main engine on the Space Shuttle weighs as much as a train locomotive, but puts out as much horse power as 39 locomotives.



# SPACE SHUTTLE **FACTS**

- The Space Shuttle is one of the most complicated and innovative machines ever built. It was a huge leap in technology when the first shuttle was launched, because it represented spacecraft that was reusable.
- Crews range in size from five to seven people. Over 600 crew members have flown on shuttle missions. Space shuttles have also sent more than 3 million pounds of cargo into space. The longest any shuttle has stayed in orbit is 17.5 days, in November 1996.
- A Space Shuttle and its boosters ready for launch are the same height as the Statue of Liberty but weigh almost three times as much.
- The shuttle launches like a rocket, orbits like a spacecraft, and lands like a plane.



The Space Shuttle Program  
30-year commemorative patch.  
Credits: NASA



The space shuttle lands as a glider at NASA's  
Kennedy Space Center in Florida.  
Credits: NASA

- NASA will test its new deep space exploration system beginning with an uncrewed flight of SLS and Orion, known as Exploration Mission-1.
- NASA will build up its deep space capabilities before ultimately sending humans to the Red Planet.





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**AEROSPACE**

- a. Pertains to Air and Space
- b. Pertains to Aviation and Space Flight
- c. Pertains to Space Observation

**SATELLITE**

- a. Celestial Body
- b. Travelling Spaceship
- c. Space Station

**AERONAUTICS**

- a. Science of travel through the air
- b. Study of the atmosphere
- c. Technology related to space engineering

**MISSION**

- a. Pertains to Air and Space
- b. Pertains to Aviation and Space Flight
- c. Pertains to Space Observation

**HORSEPOWER**

- a. Spaceship name
- b. Strength of horses
- c. Unit power of an engine

**LIFTOFF**

- a. Vertical takeoff
- b. Longevity of spaceflight
- c. Lifting power of space rockets

**ORBIT**

- a. Path followed by planets
- b. Sphere of space activity
- c. Pertains to Space Observation

## KEY ANSWER

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