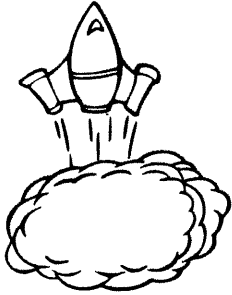


Twelve Men on the Moon

Celebrating the first walk on the moon brings talks of new missions.



The 35th anniversary of 1969's historic Moon landing was marked by celebration and a renewed push to return to the lunar surface. The remarkable achievement was accomplished without the help of technology that space scientists now take for granted. "We went to the moon with slide rules," said Norman Chaffee, who helped engineer the spacecraft propulsion system. "I didn't even have my first full-function calculator until 1972."

I stared up at the moon and couldn't believe what we had just done," remembers Jay Greene, who was chief engineer at Johnson Space Center almost four decades ago. Astronauts Neil Armstrong and 'Buzz' Aldrin felt the same way as they prepared to put the first human footprints on the Moon. As he stepped out of the

Apollo 11 spacecraft ahead of Aldrin, Armstrong uttered the famous line that was heard around the world: "That's one small step for man, one giant leap for mankind."

The moonwalk may have gone smoothly, but the Eagle Lander's descent was anything but. Almost 15 km above the lunar surface, Armstrong and

Aldrin withstood a shock wave, rocking from side to side as glowing plasma buoyed the spacecraft in a vacuum. Despite the heat and violent shaking, the astronauts were able to keep their cool, aided by the Eagle's rudimentary computer systems, which fired control rocket thrusters to steady the craft.

Armstrong and Aldrin stayed on the moon for two hours. The astronauts collected soil and rock samples, took photographs, and left behind a number of scientific instruments. There were seven Apollo missions to the moon between 1969 and 1972, but one of them, Apollo 13, failed to land on the moon. The other six missions landed two men each. Twelve human beings have walked on the moon.

After decades of space missions that have largely ignored the Moon, U.S. President George Bush has a plan that would use the lunar surface as a base for travels to Mars and beyond. "We will build new ships to carry man forward into the universe, to gain a new foothold on the Moon and prepare for new journeys to the worlds beyond our own," Bush says. No manned missions are expected before 2020. ★

Although the Russians were first to get a person into space, no Russian has ever landed on the moon.

Slide rule Two rulers side by side so that multiplication, division, and other more complex computations are reduced to addition or subtraction.

Plasma An electrically neutral, highly ionized gas composed of ions, electrons, and neutral particles. It is a phase of matter distinct from solids, liquids, and normal gases.

Questions

Facts

1. Who were the first two people to ever walk on the moon? In what year did they do it? _____

2. List three things the astronauts did during their time on the moon. _____

3. Why does U.S. President Bush want American astronauts to go to the moon again? _____

Ideas

1. Do you think landing on the moon was a "giant leap for mankind"? What other giant leaps do you think mankind should try to make? _____

2. List some other amazing scientific or engineering achievements that were done without full-function calculators. What were the driving forces behind each one? _____
