

Early Space Missions / Current & Future Space Missions (p. 635 – 649)I. The First Missions Into Space

1. To escape Earth's gravity, how fast must spacecraft travel?

11 km/sec.

2. Define the term rockets.

Rockets – special engine that can work in space and burns liquid or solid fuel

3. Identify the difference between liquid-propellant and solid-propellant rockets.

Liquid-Propellant – ^(liquid oxygen) Can be shut down + reignited after ignited

Solid-Propellant – Can't be shut down after ignited

4. Define the term satellite.

Satellite – any natural or artificial object that revolves around another object

5. What is the name of the first artificial satellite sent into space? Sputnik I (1957)

6. Define the term orbit.

Orbit – curved path followed by a satellite as it revolves around an object

7. What two natural forces maintain the position of satellites in orbit?

1. Gravity 2. Inertia

II. Space Probes

1. Define the term space probe.

Space Probe – instrument that travels far into the solar system and gathers data that it sends back to Earth

2. What does NASA stand for?

N National

A Aeronautics

S Space

A Administration

3. Identify the names of the following space probes.

- 1959 Luna 2 (USSR) - 1st spacecraft to impact the surface of the Moon
- 1962 Ranger 4 (USA) - 1st U.S. spacecraft to impact the surface of the Moon
- Mariner 2 (USA) - 1st successful planetary probe to Venus
- 1965 Mariner 4 (USA) - visits Mars; took photos showing a cratered surface
- 1966 Surveyor 1 (USA) - 1st U.S. soft landing on the Moon
- 1967 Venera 4 (USSR) - visits Venus; 1st probe sent into Venus atmosphere
- 1968 Apollo 8 (USA) - 1st manned lunar fly-around and Earth return
- 1969 Apollo 11 (USA) - 1st manned lunar landing
- 1970 Apollo 13 (USA) - Lunar Module used as a lifeboat
- Venera 7 (USSR) - visits Venus; 1st successful landing on another planet
- 1971 Mars 3 (USSR) - 1st successful spacecraft landing on Mars
- Apollo 15 (USA) - 1st use of Lunar Roving Vehicle; 1st deep space walk
- 1972 Pioneer 10 (USA) - 1st probe to Jupiter; took photos and collected data
- 1974 Mariner 10 (USA) - 1st probe to Mercury
- 1975 Venera 9 (USSR) - 1st black & white images of the Venusian surface
- Viking 1 (USA) - maps Martian surface
- 1977 Voyager 1 (USA) - visits Jupiter (1979); visits Saturn (1980)
- Voyager 2 (USA) - visits Jupiter (1979); Saturn (1981); Uranus (1986); Neptune (1989)
- 1986 Saigake (Japan) - Halley's Comet flyby
- Giotto (ESA) - Halley's Comet flyby
- Europa
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1989 Galileo (USA) - visits Jupiter (1995)
- 1990 Muses-A (Japan) - 1st non USA or USSR probe to reach the Moon
- 1996 Mars
Pathfinder (USA) - Sojourner (rover) collects rocks, pictures, and data
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Cassini (USA) - sent to explore Saturn's atmosphere, rings, satellites (Titan)
- 1998 Nozomi (Japan) - 1st Japanese spacecraft to reach another planet
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Lunar
Prospector (USA) - water test on the Moon
- 2003 Mars
Odyssey (USA) - rovers Spirit & Opportunity analyze Martian rocks & soil
- 2004 Pluto-Kuiper Express (USA) - 1st space probe sent to Pluto (time to planet = 12 yrs)

III. Moon Quest**1. Match the following people with the correct accomplishments.**

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| 1. <u>C.</u> - Yuri Gagarin | A. First U.S. citizen to orbit Earth (1962) |
| 2. <u>F.</u> - Alan Shepard | B. Second person to set foot on the Moon (1969) |
| 3. <u>A.</u> - John Glenn <u>p.641</u> | C. First human in space (1961) |
| 4. <u>E.</u> - Neil Armstrong | D. Piloted Command Module around Moon (1969) |
| 5. <u>B.</u> - "Buzz" Ediwon Aldrin | E. First person to set foot on the Moon (1969) |
| 6. <u>D.</u> - Michael Collins | F. First U.S. citizen in space (1961) |

2. Match the NASA projects with the correct goals.

- | | |
|--|---|
| 1. <u>C.</u> - Project Mercury | A. Connect spacecraft in orbit / Space travel effects |
| 2. <u>A.</u> - Project Gemini | B. Landing on the Moon |
| 3. <u>B.</u> - Project Apollo <u>p.642</u> | C. Orbit a piloted spacecraft around Earth and return |

IV. The Space Shuttle**1. Define the term space shuttle.**p.643

Space Shuttle - reusable spacecraft that can carry cargo, astronauts, and satellites to and from space.

2. List the space shuttles and their years of service. (Not in the book.)

<u>Space Shuttle</u>	<u>Years Of Service</u>
Columbia	(1981 - 2003) re-entry
Challenger	(1983 - 1986) takeoff
Discovery	(1984 - 2010)
Atlantis	(1985 - 2010)
Endeavour	(1992 - 2010)

V. Space Stations**1. Define the term space station.**p.644-645

Space Station - large facility with living quarters, work + exercise areas, and equipment and support systems for humans to live and work in space and conduct experiments

2. List the three space stations put into orbit around Earth.

1. Skylab - (U.S.) - (1973 - 1979)
2. Mir - (U.S.S.R.) - (1986 - 2001)
3. I.S.S. - (16 nations) - (Started 1998, Finished 2006)