Helping your children choose books they will love

I reading

Lovereading4kids.co.uk is a book website created for parents and children to make choosing books easy and fun

extract from

Insiders Series: Space

published by

Templar

All Text is Copyright © of the Author and/or Illustrator

please print off and read at your leisure.

Lovereading4kids.co.uk

Our Place in

Space

Space is really big! The planet we live on, Earth, is just one in a family of eight planets in our Solar System. Earth orbits a yellow dwarf star—the Sun. Though important to us, our Sun is just one of billions of other suns that make up a spiral-shaped galaxy called the Milky Way. We see our Sun in the day; our galaxy's other suns appear as the stars of the night sky. As big as our galaxy is, it is just one member of a local group of several dozen galaxies that, in turn, are just a small part of a vast network of billions of other galaxies. All these planets, stars, and galaxies make up what we call the universe.

The cosmic neighborhood

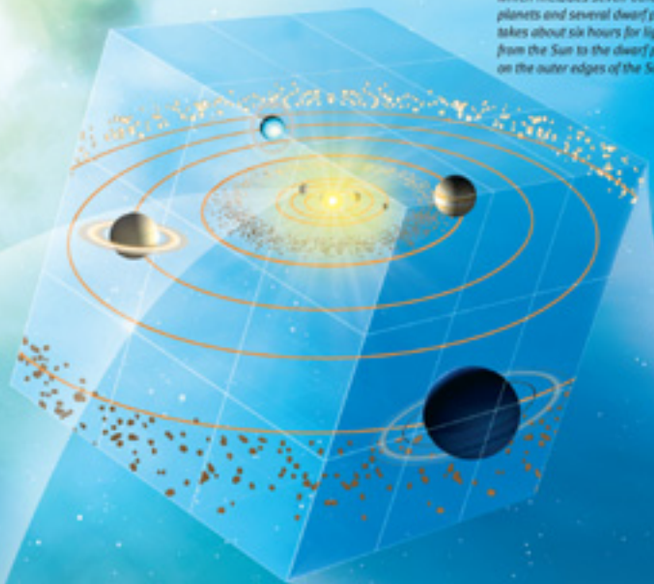
Our nearest neighbors in space are the worlds of our Solar System. They are close enough for people and robot probes to visit them. But beyond our neighborhood, the vast distances of space make it impossible for us to travel to other stars and galaxies.



The blue marble
Astronauts who visited the Moon saw the distant Earth as a blue marble floating in the blackness of space, above the gray, lifeless landscape of the Moon.



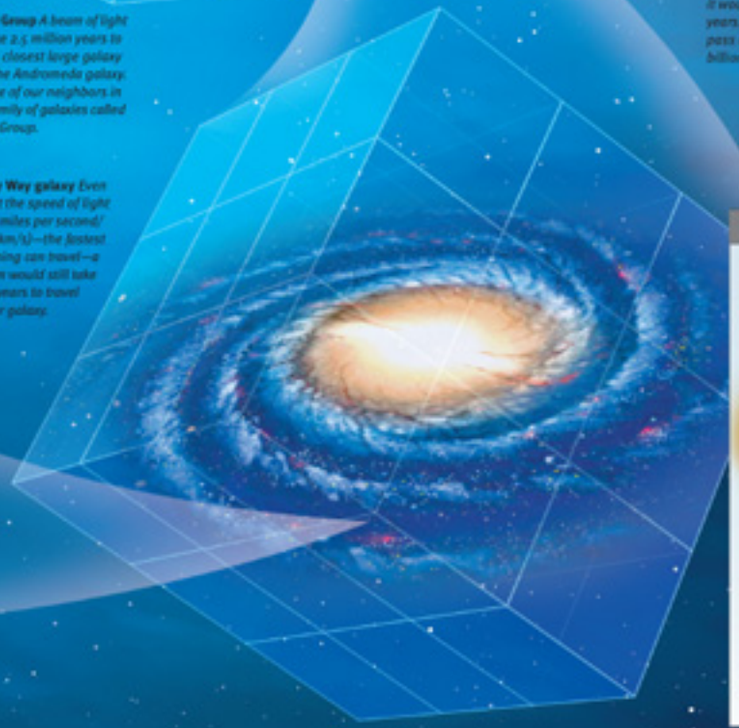
Earth *Our home is a small, watery, blue planet that orbits about eight light-minutes from the warmth and light of an ordinary yellow star, the Sun. So far, Earth is the only place in the universe where we know life exists.*



The Solar System *Zoom out, and Earth is just one planet in a system of worlds, which includes seven other major planets and several dwarf planets. It takes about six hours for light to travel from the Sun to the dwarf planet Pluto, on the outer edges of the Solar System.*



The Local Group *A beam of light would take 2.5 million years to reach the closest large galaxy to ours, the Andromeda galaxy. This is one of our neighbors in a small family of galaxies called the Local Group.*



The Milky Way galaxy *Even zipping at the speed of light (186,000 miles per second/300,000 km/s)—the fastest that anything can travel—a light beam would still take 100,000 years to travel across our galaxy.*



The known universe
To reach the most distant objects in the known universe, even traveling at the speed of light, it would take nearly 14 billion years. Along the way we would pass chains and clusters of billions of other galaxies.

LIGHT-YEARS

Light takes eight minutes to get from the Sun to Earth. In one year light can travel almost six trillion miles (10^{12} km), a distance we call one light-year. So "light-year" measures distance, not time.



Light-years from Earth to . . .

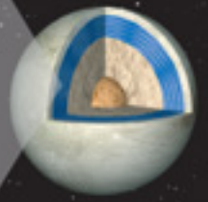
The Moon	1 light-second
The Sun	8 light-minutes
Pluto	6 light-hours
Proxima Centauri (nearest star)	4.2 light-years (ly)
Orion Arm of Milky Way	5,000 ly
Andromeda (nearest big galaxy)	2.5 million ly
Edge of visible universe	13.7 billion ly

Exploring Space

We have learned almost everything we know about the planets with the help of robots. We call them space probes. Since the 1960s, they have roamed the Solar System as our robot eyes and ears, to explore where no one has ever gone. People have traveled only as far as the Moon, but robots have visited all the major planets, and one is on its way to the dwarf planet Pluto. Some probes fly past their targets, then continue out of the Solar System, never to return. Others orbit their destination planets or land to explore the surface. A few probes return to Earth, bringing samples back—perhaps dust from a comet, or one day rocks from the surface of Mars.



Perhaps European plant and animal life thrives in deep-sea vents, where heated water erupts from below.



Possible life?
One day a probe may explore Europa, a moon of Jupiter that contains a global ocean under a frozen ice crust. Where there is liquid water, there may be life.



Launch *A powerful rocket propelled New Horizons away from Earth at 36,000 miles per hour (58,000 km/h), faster than any other probe.*

Jupiter gravity assist *Only a year later, the little probe sped past Jupiter, getting a further boost in speed from the giant planet's gravity.*

Interplanetary cruise *For eight years it will sleep, signaling Earth just once a week, waking 50 days per year to make measurements.*

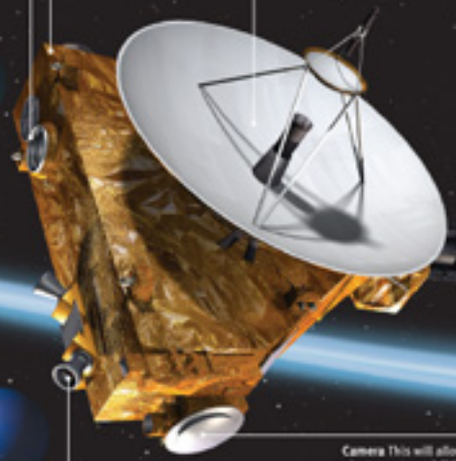
Traveling with New Horizons

Years in the planning, a probe was finally launched toward Pluto in January 2006. No probe has visited Pluto; fuzzy views from Earth show little on this tiny world. New Horizons will reveal details as small as football fields on Pluto and its moons.

Telescope The probe will use this lens to take long-range and close-up images of Pluto and its moons.

Atmosphere detectors These will detect any gases and particles streaming away from Pluto's thin atmosphere.

Antennae New Horizons will never return. It transmits all its data back to Earth using these antennae.



Power source Traveling too far from the Sun for solar power, New Horizons gets electricity from nuclear-powered generators.

Camera This will allow the probe to capture visible and infrared maps of Pluto's and Charon's surfaces.

Steering rockets Side-mounted rockets turn and aim the piano-size probe.

Pluto–Charon encounter *The probe will finally reach its destination in July 2015, photographing Pluto and its moons.*



Encounters in the Kuiper Belt *New Horizons will speed on, possibly to encounter one or more Pluto-like objects in the Kuiper Belt.*

MISSIONS IN PROGRESS

Mars is the prime target for current and future missions. Probes are also exploring Mercury, Venus, and Saturn. Scientists hope to launch probes to asteroids, comets, and the moon Europa.



Venus Express
This European Space Agency (ESA) mission orbits Venus, charting its complex weather patterns, analyzing its atmosphere, and looking for evidence of active volcanoes.

Current missions

Cassini Saturn orbiter, launched October 15, 1997
Messenger Mercury mission launched August 3, 2004
Mars Reconnaissance orbiter launched August 2005; in orbit around Mars
Venus Express launched November 9, 2005; in orbit around Venus
New Horizons mission to Pluto and beyond; launched January 19, 2006

Piano-size probe
Though bigger than a 10-year-old (4.5 feet/1.3 m), New Horizons is small for a space probe.



Probing achievements

In 50 years we have gone from simple satellites orbiting Earth to smart robots flying beyond the Solar System.



Mariner 2

1957 The Soviets' Sputnik 1 and 2 are the first artificial satellites of Earth.

1958 The US launches its first satellite, Explorer 1.

1959 Luna 2 makes the first soft landing on the Moon and sends back pictures.

1962 The US Mariner 2 is the first probe to reach another planet, Venus.

1965 Mariner 4 is the first probe to fly past Mars.

1970 Venera 7 is the first craft to land on another planet—Venus.

1973 The successful NASA probe Pioneer 10 is the first to reach Jupiter.

1976 NASA lands the first two successful crafts on Mars, Viking 1 and 2.

1979 Pioneer 11 is the first probe to reach Saturn.

1986 Voyager 2 reaches Uranus; the ESA's Giotto and the Soviets' Vega 1 and 2 are the first probes to intercept a comet—Halley's.

1989 Voyager 2 reaches Neptune.

1990 NASA's Magellan reaches Venus and radar-maps its entire surface.

1997 Pathfinder lands and deploys the first Martian rover, Sojourner.

2000 The probe NEAR–Shoemaker orbits and maps the asteroid Eros.

2004 Cassini–Huygens mission arrives at Saturn; Mars Rovers land on Mars.

2005 NASA's Deep Impact probe arrives at Comet Tempel 1; Huygens lands on Titan.

2006 New Horizons probe launched; NASA's Stardust returns comet dust samples.

Sputnik

Luna 9

Viking 1

Giotto

Voyager 2

NEAR–Shoemaker