

St Aiden's Homeschool



Our Solar System

Uranus

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Uranus



Uranus as seen from Voyager 2



Uranus Facts:

- Uranus's rings look white in pictures, but they are really made of asphalt-coloured material.
- When it was first discovered, Uranus was mistaken for a star. It was named "34 Tauri".
- Uranus rotates on its side. It is the only planet to do so.
- Uranus is the only planet to be named after a Greek god, not a Roman one.
- Uranus, the seventh planet from the Sun, was discovered by William Herschel on March 13, 1781.
- When William Herschel discovered Uranus, he at first thought he had discovered a comet.

Uranus is one of the smaller gas giants in our solar system, but it is still large enough to hold 64 planets the size of Earth.

Uranus tilts over so far on its axis that it rotates on its side. Because of this, its poles are sometimes pointed almost directly at the Sun. Uranus' atmosphere is made up of hydrogen, helium, and methane. The temperature in the upper atmosphere is very cold. The cold methane gas is what gives Uranus its blue-green colour. The rapid rotation of Uranus causes winds up to 600 kilometres per hour to blow in its atmosphere. Uranus has eleven known rings which contain dark, boulder-sized particles. Uranus has 27 named moons. Some of these moons are less than 100 kilometres wide and black as coal.

How big is Uranus?

Comparison of the size of Uranus and the Earth

Uranus is 51,118 kilometers or about four Earths wide. It is the third widest and fourth heaviest planet in the Solar System.



What is the surface of Uranus like?

Uranus does not have a surface that you could stand on without going deep into the **atmosphere**. Under the atmosphere, there may be an even mixture of rock and ice.

What are the rings around Uranus like?

Uranus has eleven rings. They are dark in colour and very hard to see. They were discovered by accident in 1977. Scientists were studying a bright star near Uranus. However, the star's light was blocked before and after it disappeared behind Uranus. From this, they figured out that Uranus has a ring system.

Uranus' Satellites



Uranus has 21 named moons and six unnamed ones:

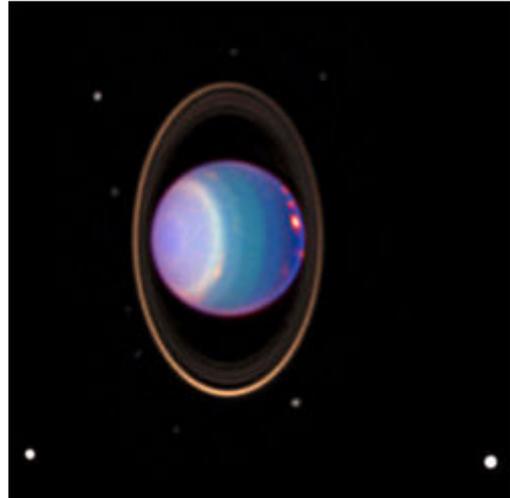
- Unlike the other bodies in the solar system which have names from classical mythology, Uranus' moons take their names from the writings of Shakespeare and Pope.

- They form three distinct classes: the 11 small very dark inner ones discovered by Voyager 2, the 5 large ones (right), and the newly discovered much more distant ones.
- Most have nearly circular orbits in the plane of Uranus' equator (and hence at a large angle to the plane of the ecliptic); the outer 4 are much more elliptical.

What are its moons like?

Uranus's rings and moons

Uranus has 27 known moons, which places it third in the Solar System for number of moons! The five main ones are Miranda, Ariel, Umbriel, Titania and Oberon.



Miranda

Miranda is the smallest and closest of Uranus's major moons. It is mainly made of ice and rock. Miranda's surface has grooves, cliffs, and valleys. The moon was named after a character in *The Tempest*, a play by Shakespeare.

Ariel

Ariel is made of rock and ice. Ariel has many valleys, but not many craters. Ariel was named after a character in the poem *The Rape of the Lock* by Alexander Pope. Ariel is also a spirit in *The Tempest* by Shakespeare.

Umbriel

Umbriel is made of lots of ices and some rock. It is also the darkest of Uranus's major moons. Umbriel was named after a character in the poem *The Rape of the Lock* by Alexander Pope.

Titania

Titania is the largest moon of Uranus. It is mostly ice and rock. The surface is covered with canyons. It was named after the Queen of the Fairies in *A Midsummer's Night Dream*, a play by Shakespeare

Oberon

Oberon is the outermost of the major moons of Uranus. It is made of the same things as Titania. It has many craters. Some of them have white rays around them and dark crater floors. It was named after the King of the Fairies in *A Midsummer's Night Dream*.

Other Moons

There are 13 tiny moons known to be **orbiting** Uranus inside Miranda's orbit. Nine more tiny moons are known to be in big orbits beyond Oberon's orbit.

How long is a day on Uranus?

One day on Uranus is about 27 Earth hours long. Uranus spins on its side, maybe because of a big impact early in the history of the Solar System.

How long is a year on Uranus?

One year on Uranus would be 30,708 days or 84 years on Earth.

What is Uranus made of?

Unlike Jupiter and Saturn, Uranus is thought to be made mostly of rock and ice. The gases in its atmosphere are mostly **hydrogen** and **helium**. Other gases found in smaller amounts are ammonia, water, and **methane**. Uranus' blue colour comes from **methane** clouds, which absorb red light and reflect blue light.

How much would Uranus's gravity pull on me?

If you were floating close to the cloud tops of Uranus, you would be pulled down with a force about 86% of Earth's gravity.

Who is Uranus named after?

Uranus was named after Ouranos, the Greek name for the sky. According to Greek mythology, Uranus is the ancient Greek deity of the Heavens, the earliest supreme god. Uranus was the son and mate of Gaia, Mother Earth the father of Cronus (Saturn) and of the Cyclopes and Titans (predecessors of the Olympian gods).

Who Discovered Uranus?

Uranus, the first planet discovered in modern times, was discovered by William Herschel while systematically searching the sky with his telescope on March 13, 1781. It had actually been seen many times before but ignored as simply another star (the earliest recorded sighting was in 1690 when John Flamsteed catalogued it as 34 Tauri). Herschel named it "the **Georgium Sidus**" (the Georgian Planet) in honour of his patron, the infamous (to Americans) King George III of England; others called it "Herschel". The name "Uranus" was first proposed by Bode in conformity with the other planetary names from classical mythology but didn't come into common use until 1850.

Uranus has been visited by only one spacecraft, Voyager 2 on Jan 24 1986. Voyager 2 discovered 10 small moons in addition to the 5 large ones already known. It is likely that there are several more tiny satellites within the rings.

Uranus is sometimes just barely visible with the unaided eye on a very clear night; it is fairly easy to spot with binoculars (if you know exactly where to look). A small astronomical telescope will show a small disk. There are several Web sites that show the current position of Uranus (and the other planets) in the sky, but much more detailed charts will be required to actually find it. Such charts can be created with a planetarium program.

Fact Sheet

Uranus

Seventh planet from the Sun



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Before Uranus was recognized as a planet, several astronomers had observed Uranus but recorded it as a fixed star. William Herschel discovered Uranus and tried unsuccessfully to name his discovery after Britain's King George III; the planet was named in 1781 for the mythological father of Saturn. Satellites in the Uranian system are named for characters in Shakespeare's plays and from Pope's *Rape of the Lock*.

Uranus rotates on its side – its pole is tilted 90 degrees to the plane of the solar system. Its motion against the field of background stars shows it to be a planet. The word "planet" is derived from a Greek word for "wanderer."

Orbit

19.2 astronomical units (AU) from the Sun
Earth is 1 AU from the Sun

Length of year

83.75 Earth years

Length of Day

17.2 Earth hours

Tilt of Rotation Axis

97.8 degrees versus 23.5 degrees for Earth

Size

Diameter: 4 times Earth's diameter

Surface Gravity

0.9 of Earth's gravity

If you weigh 80 pounds on Earth, you would weigh about 72 pounds on Uranus!

Mass

14.5 times greater than Earth's mass

Atmosphere

Primary components: 83% hydrogen, 15% helium, 2% methane

Surface

The gas planets do not have solid surfaces; their gaseous material simply gets denser with depth. What we see when looking at these planets are the tops of clouds high in their atmospheres.

Uranus is composed primarily of rock and various ices, with only about 15% hydrogen and a little helium (in contrast to Jupiter and Saturn which are mostly hydrogen). Uranus (and Neptune) is in many ways similar to the cores of Jupiter and Saturn minus the massive liquid metallic hydrogen envelope. It appears that Uranus does not have a rocky core like Jupiter and Saturn but rather that its material is more or less uniformly distributed.

Moons

Uranus has 22 named moons and 5 unnamed moons (as of July 2004)

Past Missions

Voyager 2, on January 24, 1986

Student Activity ~ Uranus

Describe Uranus.

How big is it?

What is its surface like?

Why is there no life on Uranus?

How many Moons does Uranus have?

How long is a day and a year on this planet?

What is Uranus made of?

What are its rings like?

What are its moons like?

• **Miranda**

• **Arial**

• **Umbriel**

• **Titania**

• **Oberon**

• **Other moons**
