# Astronomy for Kids - Earth

## There's No Place Like Home

Our home planet is a very interesting place. From space, it looks like a big blue marble, with the constantly changing cloud patterns giving our home planet an ever-changing appearance. There are a number of things that make our planet unique in the solar system, not the least of which is that we are the only planet so far that we know for certain has ever had life of any kind. This may change in the future, but so far we humans are the only life form that we have found.
Among the things that have made life as we know it possible here on Earth are the facts that most of the surface of our planet is covered with water and we are protected from most of the Sun's dangerous radiation by our atmosphere. Our atmosphere, which is the layer of gas surrounding Earth, is made up of about seventy-seven percent nitrogen, which is what the plants breathe, and about twenty-one percent oxygen, which is what we humans breathe.

**Earth Facts**

**Distance from Sun**
Approximately 93 million miles
**Number of Moons**
One
**Diameter**
7,600 miles
**Length of Day**
24 hours
**Length of Year**
365 days
**Name**
Comes from old English and German

## A Big Blue Marble

If other beings exist, and they are watching our solar system with their telescopes, the view of our home planet must be very interesting, indeed. Because over seventy percent of Earth's surface is covered with water, the predominant color they would see is blue. However, the continents would provide an interesting color show of their own, ranging from the stark white of Antarctica, through the browns of north Africa and on to the mostly greens of Asia and the Americas. At the same time, the oceans and our atmosphere interact with each other to create constantly changing cloud patterns that would resemble a kind of kaleidoscope.
It would present as great a puzzle to them as the gas giants of our own solar system (Jupiter, Saturn, Neptune and Uranus) present to scientists here on Earth.

**Earth**

A picture of Earth from Apollo 17.

## A Very Large Onion

If you could cut a section out of Earth and look inside, you would see what looks like a very large onion. Our home planet has many "layers", ranging from a very dense inner core, made mostly of iron, to the outermost layer, which is the one we live on.
In between the solid central core of our planet and the outer layer that we live on is what amounts to a vast sea of molten, or semi-melted rock. This molten layer, called "magma" is very hot and occasionally breaks through, or erupts, to the surface. When this happens, we have what we have come to know as a volcano. Many features on our planet's surface, including the Hawaiian islands, are a direct result of this volcanic activity. After a volcanic eruption occurs, the melted rock, called "lava", that makes it to surface cools off and eventually changes back into solid rock. If enough eruptions occur at the same place, the rock that accumulates can form islands in the ocean or mountains on land.

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The sea of molten iron that makes up most of Earth is also what makes the surface of our planet a constantly changing place. Scientists believe that hundreds of millions of years ago, all of the land that is here was concentrated into one giant continent instead of the seven we have now. Over a very long period of time, the original giant land mass was broken up into the several continents that we have now. You can see for yourself how this has happened by noticing how the shapes of some of the continents, South America and Africa, for example, seem to fit together like pieces of a giant puzzle. This process continues to this day. As hard as it might be to believe, the continents that we are familiar with are actually drifting around, like crackers on a bowl of soup.

**Earthrise**

A picture of Earth rising over the Moon.

## The Fascinating Surface of Earth

The surface of our home planet is the most widely varied surface of any planet n the solar system. The motion of the continents we mentioned before, in combination with the winds of the atmosphere, rain that falls from the clouds in the sky and volcanic eruptions, along with other events, has turned our planet into an almost magical place.
In the western United States, for example, you can go from the desert floor of Death Valley to the peaks of mountains in the space of a few hundred miles. The Hawaiian Islands rise from the floor of the Pacific Ocean to the peak of Diamond Head. All in all, if you want to visit a planet with the most interesting features in the solar system, you need look no further than your own back yard.

**Grand Canyon**

The Grand Canyon as it appears from space.

## The Changing Seasons

If you happen to live very far north or south of the equator, which is the imaginary line at the middle of our planet, you will notice that the weather goes through four seasons. Our seasons occur because Earth does not stand straight up on its axis, but instead is slightly tilted on its north to south axis (the axis is the imaginary line that runs through the planet, just like the spindle in a toy top). As Earth goes around the Sun during the year, different parts of the planet are tilted towards the Sun. For example, here in the Unites States, we have our warmer months during summer because at that time of the year our part of the planet is tilted towards the Sun. At the same time, people in the southern hemisphere are experiencing winter because their part of the planet is tilted away from the Sun. While we have the colder weather during the winter season, residents of the southern hermisphere are having summer.

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## Our Only Moon

Earth has only one moon, but it has a large effect on our culture as well as our sky. We are the only planet in the solar system that has total solar eclipses, which is what happens when the Moon completely blocks our view of the Sun. We also have lunar eclipses, which happen when the Moon passes through Earth's shadow. In addition, our Moon goes through "phases" that not only make for interesting viewing in the night sky, but also serve as the basis for the months in our calendar.

Our Moon is the only body in the solar system besides Earth that has had human visitors. During the late 1960's and on into the 1970's men landed on the Moon and explored it a dozen times. The research that was done during and after these missions has told us that the Moon is a fascinating place in its own right.

**The Moon**

Click here to learn more about our Moon.

**Find Out More About Earth**

Earth Page at the Nine Planets Site
: The Earth section of the Nine Planets site has more detail about our home planet.

The Landsat Project
: The Landsat project is an excellent source of images of our home planet taken by satellites. You may be able to find your home town, or even your house!

NASA's Earth Observatory
: The Earth Observatory site has a very impressive collection of images of our home from outer space as well as news about studies of our planet.

Terraserver
: The Microsoft Terraserver project is trying to become the central place to look for images of Earth on the web. Some of these images are absolutely incredible.

# Astronomy for Kids - Earth from Apollo 17

## Earth from Apollo 17

Image courtesy of: NASA, Apollo 17

A spectacular picture of Earth taken by the crew of Apollo 17.

# Astronomy for Kids - Earthrise

## Earthrise

Image courtesy of: NASA, Apollo Project

The crew of the Apollo 8 mission sent back this image of Earth rising over the horizon of the Moon during Christmas of 1968.

# Astronomy for Kids - The Grand Canyon

## The Grand Canyon

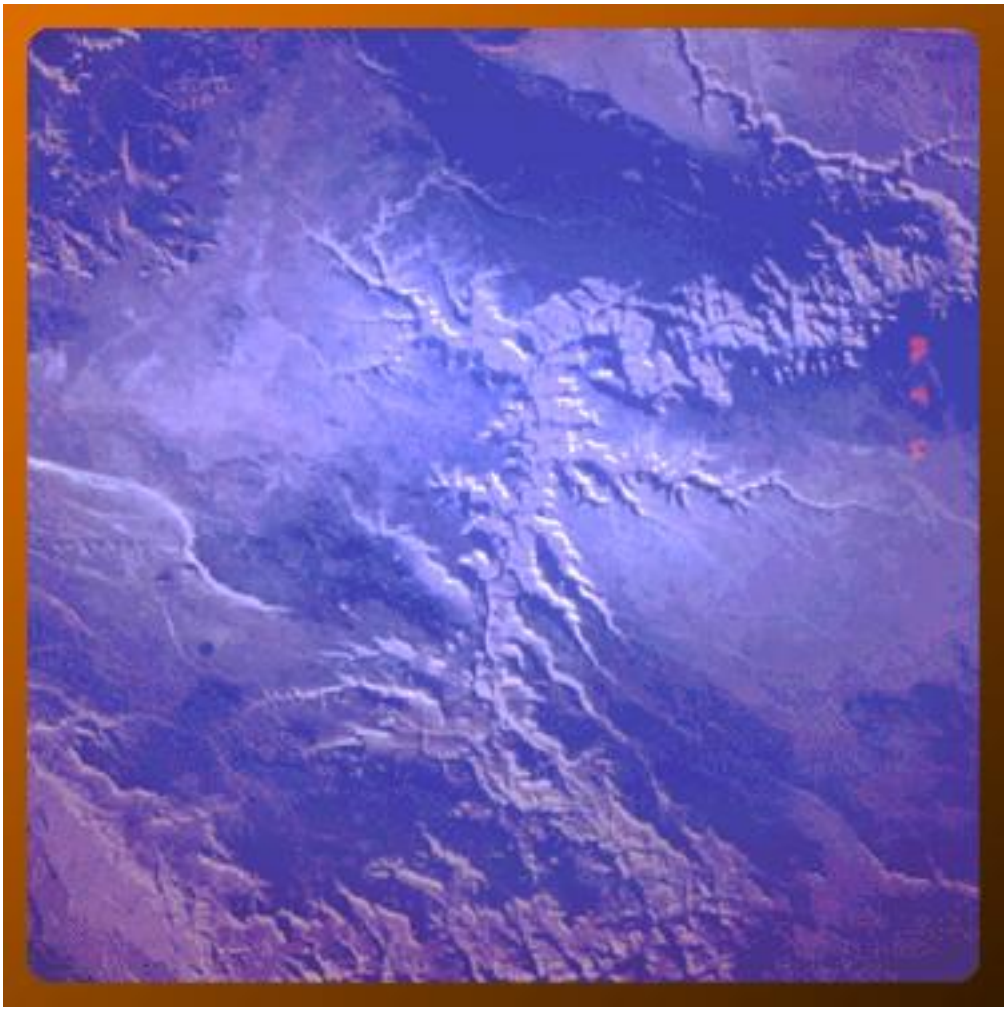

Image courtesy of: NASA

The Grand Canyon in Arizona is just one of the features on Earth that is visible from space.

# Astronomy for Kids - The Moon

## Our Beautiful Moon

Our home planet has only one moon, but it is a significant element of our everyday life. From our calendar, which is loosely based on the phases that the Moon goes through, to all the superstitions that are based on the phrase "It's a full Moon" on to the impact that the Apollo space program had on all our lives, the Moon affects us in ways that we take for granted.

In addition to the social and cultural impact that the Moon has on all of us, it has a daily physical impact on those people that live near large bodies of water. The Moon and the Sun are responsible for the daily high low tides of the world's oceans.

**The Moon and Planets**

Image courtesy of: JPL/NASA

## A Dragon is Eating the Sun!

One of the sky's most impressive shows occurs when we have either a lunar or solar eclipse. A solar eclipse occurs when the Moon passes in front of the Sun and a lunar eclipse happens when the Moon passes through the Earth's shadow. Until astronomers found out that eclipses could be predicted, people usually thought that an eclipse was an omen that something bad was about to happen. Among the things that people believed was that a dragon, or some other dreadful creature, was actually devouring the Sun! Fortunately, we have learned that eclipses are something to enjoy rather than fear.

## The Origin of the Moon

One of the most interesting questions scientists have studied over the years is "Where did the Moon come from?". There have been many theories throughout history, ranging from mythical explanations to one that says the Moon is an asteroid that was captured as it flew by our planet. The currently accepted theory is that our Moon was formed when a body of some kind hit our planet approximately where the Pacific Ocean is now. The impact was so violent that a piece of our planet was torn away and eventually became the Moon that we are familiar with now.

**The Earth and Moon**

Image courtesy of: JPL/NASA

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After the Moon was formed it still had to survive in the violent and dangerous world that was our early solar system. Thousands and thousands of other bodies impacted the Moon as time went on, leaving the countless craters you can see on the surface of the Moon. You can see many of these craters using nothing more than a good pair of binoculars or a small telescope.
The other result of these many impacts are what ancient people thought were oceans on the surface of the Moon. The large dark areas that do look a little like bodies of water from here on Earth are actually large areas that were once molten rock that cooled off and made the relatively large, flat areas that we see today. The most famous of these "oceans" on the Moon is the Sea of Tranquility, which is where the Apollo 11 astronauts landed.

**The Moon and Venus**

Image courtesy of: JPL/NASA

## The Dark Side of the Moon

Among the more persistent myths about the Moon is the one about the Moon having a "dark" side. If you have spent any time at all watching our Moon, you undoubtedly will have noticed that our view of it doesn't change. We can always see "the Man in the Moon" assuming that the Moon is full enough. To a casual observer, this might mean that the Moon doesn't rotate. The facts are that the Moon does rotate on its axis just like Earth does. The suprising fact is that the speed of the Moon's rotation is such that it always shows us the same view. Half of the Moon is always illuminated just like half of Earth is always illuminated. The Moon has "days" just like Earth does, which means that there is no side of the Moon that is always dark.

## Once in a Blue Moon

One of the folk sayings that has persisted in our culture is "Once in a Blue Moon", which is an old-fashioned way of saying that something doesn't happen very often. This phrase is another example of how the Moon affects our everyday culture. During a normal month, we will have just one full Moon. One very rare occasions, however, we get treated to two full Moons on a month. The second full Moon is called a Blue Moon, so we have come to use the saying "Once in a Blue Moon" to refer to something that doesn't happen very often.