DOWNLOAD PDF 25. OF THE PLANET MARS

Chapter 1 : Mars - Wikipedia

Mars is the fourth planet from the Sun and the second-smallest planet in the Solar System after Mercury. In English, Mars carries a name of the Roman god of war, and is often referred to as the " Red Planet " [14] [15] because the reddish iron oxide prevalent on its surface gives it a reddish appearance that is distinctive among the.

Carbon dioxide[edit] The main component of the atmosphere of Mars is carbon dioxide CO2 at When the pole is again exposed to sunlight during summer, the CO2 ice sublimes back into the atmosphere. This process leads to a significant annual variation in the atmospheric pressure and atmospheric composition around the Martian poles. It has been suggested that Mars had a much thicker, warmer, and wetter atmosphere early in its history. Such an atmosphere would have raised the temperature, at least in some places, to above the freezing point of water. It also might have gathered to form lakes and maybe an ocean. For many years, it was assumed that as with Earth, most of the early carbon dioxide was locked up in minerals, called carbonates. However, despite the use of many orbiting instruments that looked for carbonates, very few carbonate deposits have been found. Researchers have discovered a two-step process that sends the gas into space. A second photon of ultraviolet light could subsequently break the carbon monoxide into oxygen and carbon which would receive enough energy to escape the planet. In this process the light isotope of carbon 12C is most likely to leave the atmosphere. Hence, the carbon dioxide left in the atmosphere would be enriched with the heavy isotope 13C. Unlike carbon dioxide , the argon content of the atmosphere does not condense, and hence the total amount of argon in the Mars atmosphere is constant. However, the relative concentration at any given location can change as carbon dioxide moves in and out of the atmosphere. Recent satellite data shows an increase in atmospheric argon over the southern pole during its autumn, which dissipates the following spring. Water on Mars Some aspects of the Martian atmosphere vary significantly. As carbon dioxide sublimes back into the atmosphere during the Martian summer, it leaves traces of water. Seasonal winds transport large amounts of dust and water vapor giving rise to Earth-like frost and large cirrus clouds. These clouds of water-ice were photographed by the Opportunity rover in Current photochemical models alone can not explain the rapid variability of the methane levels. An analog on Earth suggests that low-temperature production and exhalation of methane from serpentinized rocks may be possible on Mars. A potential source of the discharges can be the electrification of dust particles from sand storms and dust devils. The ice can be found in trenches or in the permafrost. The electrical discharge ionizes gaseous CO2 and water molecules and their byproducts recombine to produce methane. The results obtained show that pulsed electrical discharges over ice samples in a Martian atmosphere produce about 1. In August , the Curiosity rover landed on Mars. Four measurements taken over two months in this period averaged 7. Sulfur dioxide[edit] Sulfur dioxide in the atmosphere is thought to be a tracer of current volcanic activity. It has become especially interesting due to the long-standing controversy of methane on Mars. If methane on Mars were being produced by volcanoes as it is in part on Earth we would expect to find sulfur dioxide in large quantities. No sulfur dioxide was detected in these studies, but they were able to place stringent upper limits on the atmospheric concentration of 0. Ecliptic south is up. Ozone was most likely difficult to detect on Mars because its concentration is typically times lower than on Earth , although it varies greatly with location and time. This third ozone layer shows an abrupt decrease in elevation between 75 and 50 degrees south. This circulation takes the form of a huge Hadley cell in which warmer air rises and travels toward the south pole before cooling and sinking at higher latitudes. Mars is on a quite elliptical orbit and has a large axial tilt, which causes extreme seasonal variations in temperature amongst the northern and southern hemispheres. This, in turn, affects the production of ozone-destroying hydrogen radicals. In-situ resource utilization , Terraforming of Mars , and Colonization of Mars The atmosphere of Mars is a resource of known composition available at any landing site on Mars. It has been proposed that human exploration of Mars could use carbon dioxide CO2 from the Martian atmosphere to make rocket fuel for the return mission. Two major chemical pathways for use of the carbon dioxide are the Sabatier reaction , converting atmospheric carbon dioxide along with additional hydrogen H2 , to produce methane CH4 and oxygen O2 , and electrolysis , using a zirconia solid oxide electrolyte to split the carbon dioxide into

oxygen O2 and carbon monoxide CO. However, early in its history Mars may have had conditions more conducive to retaining liquid water at the surface. In , a team of scientists proposed that Mars once had "oxygen-rich" atmosphere billions of years ago. Gradual erosion of the atmosphere by solar wind. This shift took place between about 4.

Chapter 2 : The Position of Mars in the Night Sky: to

On the fifth anniversary of NASA discovering signs of life on Mars, take a look at some stunning photos of the red planet. msn back to msn home 25 amazing photos of Mars 3/12/ SHARE. SHARE.

Science Mars Spectacular The planet Mars will not be making a once-in-our-lifetimes, remarkably close approach to Earth on 27 August Updated 27 July Published 25 July Claim The planet Mars will make a once-in-our-lifetimes, remarkably close approach to Earth on 27 August Two moons in the sky on August 27! The next time this cosmic event will happen again, will be 36, â€¦ Share this information as much as possible with your friends because NO human being alive today will be able to behold this incredible phenomenon a second time. On August 27, around midnight, do not forget to raise your head and look into the sky: Mars will be the most brilliant star in the sky. This is because it will have an apparent diameter as big as the Full Moon! It will be possible to observe, with the naked eye, a cosmic phenomenon which will allow the inhabitants of the Earth to behold â€¦ two moons! This is the first time that humanity will be able to observe this exceptional phenomenon. The last planet Mars proximity of such magnitude dates back to exactly 34, years, the Neolithic period during which Neanderthal and Homo habilis, the distant ancestors of Homo sapiens, coexisted together. Species to which the human race â€”- or more precisely, mankind â€”- belongs today. As you must have seen on TV or read in the press, the planet Mars is now closer to the Earth, it is also possible to observe the orange star at night in the sky by looking towards the South. This phenomenon is quite common and appears about every 15 years. Mars did make an extraordinarily close approach to Earth fifteen years ago, culminating on 27 August , when the red planet came within 35 million miles or 56 million kilometers of Earth, its nearest approach to us in almost 60, years. At that time, Mars appeared approximately 6 times larger and 85 times brighter in the sky than it ordinarily does. Mars also made a close approach to Earth in December , but even then it was still about 55 million miles away from us, not nearly as close as it was in or The closest encounter between Mars and Earth since will occur on 27 July , when the orbits of the two planets bring them to within Astronomers say Mars will appear twice as bright as usual around that time though it will certainly not rival the brightness or size of the full moon. The opposition will hang onto the record for the closest approach of Mars to Earth until , when it is estimated the planets will be separated by Mars gets close to Earth every two years. So, last year, Mars was very close. How wide spread is this falsehood? People get excited about it, start to send e-mail â€¦ and every August we see this e-mail coming back and I get a lot of e-mails about it, of course. The information in the previous sentence was only true during the month of August in This was a historic astronomical event. Mars was the closest it had been to Earth in 60, years. However, this already happened. The web site of the Students for the Exploration and Development of Space SEDS provides a chart displaying data about Mars Oppositions past, present, and future , and the web site of the Hubble Heritage Project offers some nice composite telescope images from previous Mars near oppositions. Sources Britt, Robert Roy. How to See It and What to Expect.

DOWNLOAD PDF 25. OF THE PLANET MARS

Chapter 3 : Mars - Mars rover Curiosity: Images from the Red Planet - Pictures - CBS News

Give me your thoughts on the video and planet Mars, please. Copyrights and Photos belong to NASA (@NASA). Link: www.nxgvision.com For more.

November 14, The Hubble Space Telescope took the opportunity to observe the red planet while it was only 34,, miles 55,, km from Earth. If you wanted to pay a visit to the red planet, how long would it take? The answer depends on a number of things, ranging from the position of the planets to the technology that would propel you there. How far away is Mars? To determine how long it will take to reach Mars, we must first know the distance between the two planets. Mars is the fourth planet from the sun, and the second closest to Earth Venus is the closest. But the distance between the two planets is constantly changing as they travel around the sun. In theory, the closest that Earth and Mars would approach each other would be when Mars is at its closest point to the sun perihelion and Earth is at its farthest aphelion. This would put the planets only However, this has never happened in recorded history. The closest recorded approach of the two planets occurred in , when they were only The two planets are farthest apart when they are both at their farthest from the sun, on opposite sides of the star. At this point, they can be million miles million km apart. The average distance between the two planets is million miles million km. The speed of light Light travels at approximately , miles per second , km per second. Therefore, a light shining from the surface of Mars would take the following amount of time to reach Earth or vice versa: In January , the probe left Earth at 36, mph 58, kph. If such a probe traveled in a straight line to Mars, the time it would take to get to Mars would be: This quiz will reveal how much you really know about some of the goofiest claims about the red planet. Quiz No planet is more steeped in myth and misconception than Mars. The numbers also assume that the two planets remain at a constant distance; that is, when a probe is launched from Earth while the two planets are at the closest approach, Mars would remain the same distance away over the course of the 39 days it took the probe to travel. The Boldest Mars Missions in History] In reality, however, the planets are continuously moving in their orbits around the sun. Engineers must calculate the ideal orbits for sending a spacecraft from Earth to Mars. Their numbers factor in not only distance but also fuel efficiency. Like throwing a dart at a moving target, they must calculate where the planet will be when the spacecraft arrives, not where it is when it leaves Earth. Spaceships must also decelerate to enter orbit around a new planet to avoid overshooting it. How long it takes to reach Mars depends on where in their orbits the two planets lie when a mission is launched. It also depends on the technological developments of propulsion systems. The website quotes physics professor Craig C. Patten , of the University of California, San Diego: Therefore, it would take about one and a half years to complete the elliptical orbit. Practically, this means that you can only begin your trip when Earth and Mars are properly lined up. This only happens every 26 months. That is, there is only one launch window every 26 months. Evolving technology can help to shorten the flight. SLS is currently being constructed and tested, with its first flight planned for Robotic spacecraft could one day make the trip in only three days. Photon propulsion would rely on a powerful laser to accelerate spacecraft to velocities approaching the speed of light. The method could propel a lb. Here is a list of how long it took several historical missions to reach the red planet. Their launch dates are included for perspective. Mariner 4 , the first spacecraft to go to Mars flyby:

Chapter 4 : FACT CHECK: Mars Spectacular

Mars is the fourth planet from the Sun and is the second smallest planet in the solar system. Named after the Roman god of war, Mars is also often described as the "Red Planet" due to its reddish appearance.

Named after the Roman God of war, its nickname comes from its reddish appearance, which has to do with the amount of iron oxide prevalent on its surface. Every couple of years, when Mars is at opposition to Earth i. Because of this, humans have been observing it for millennia, and its appearance in the heavens has played a large role in the mythology and astrological systems of many cultures. And in the modern era, it has been a veritable treasure trove of scientific discoveries, which have informed our understanding of our Solar System and its history. Size, Mass and Orbit: Mars has a radius of approximately 3, km at its equator, and 3, km at its polar regions â€" which is the equivalent of roughly 0. At its greatest distance from the Sun aphelion , Mars orbits at a distance of 1. At perihelion, when it is closest to the Sun, it orbits at a distance of 1. At this distance, Mars takes In Martian days aka. Sols, which are equal to one day and 40 Earth minutes , a Martian year is Composition and Surface Features: With a mean density of 3. The red-orange appearance of the Martian surface is caused by iron oxide, more commonly known as hematite or rust. The presence of other minerals in the surface dust allow for other common surface colors, including golden, brown, tan, green, and others. As a terrestrial planet, Mars is rich in minerals containing silicon and oxygen, metals, and other elements that typically make up rocky planets. The soil is slightly alkaline and contains elements such as magnesium, sodium, potassium, and chlorine. Experiments performed on soil samples also show that it has a basic pH of 7. Radar data and soil samples have confirmed the presence of shallow subsurface water at the middle latitudes as well. Like Earth, Mars is differentiated into a dense metallic core surrounded by a silicate mantle. Artist rendition of the formation of rocky bodies in the solar system â€" how they form and differentiate and evolve into terrestrial planets. Due to its smaller size and mass, the force of gravity on the surface of Mars is only An object falling on Mars falls at 3. The surface of Mars is dry and dusty, with many similar geological features to Earth. It has mountain ranges and sandy plains, and even some of the largest sand dunes in the Solar System. It also has the largest mountain in the Solar System, the shield volcano Olympus Mons , and the longest, deepest chasm in the Solar System: The surface of Mars has also been pounded by impact craters, many of which date back billions of years. These craters are so well preserved because of the slow rate of erosion that happens on Mars. Hellas Planitia , also called the Hellas impact basin, is the largest crater on Mars. Its circumference is approximately 2, kilometers, and it is nine kilometers deep. Mars also has discernible gullies and channels on its surface, and many scientists believe that liquid water used to flow through them. By comparing them to similar features on Earth, it is believed these were were at least partially formed by water erosion. Some of these channels are quite large, reaching 2, kilometers in length and kilometers in width. Mars has two small satellites, Phobos and Deimos. These moons were discovered in by the astronomer Asaph Hall and were named after mythological characters. In keeping with the tradition of deriving names from classical mythology, Phobos and Deimos are the sons of Ares â€" the Greek god of war that inspired the Roman god Mars. Phobos represents fear while Deimos stands for terror or dread. Phobos and Deimos, photographed here by the Mars Reconnaissance Orbiter, are tiny, irregularly-shaped moons that are probably strays from the main asteroid belt. At this distance, Phobos is below synchronous altitude, which means that it takes only 7 hours to orbit Mars and is gradually getting closer to the planet. It has a longer orbital period, taking 1. However, both moons have circular orbits near the equator, which is unusual for captured bodies. Another possibility is that the two moons formed from accredit material from Mars early in its history. However, if this were true, their compositions would be similar to Mars itself, rather than similar to asteroids. The atmosphere is quite dusty, containing particulates that measure 1. Because of its thin atmosphere, and its greater distance from the Sun, the surface temperature of Mars is much colder than what we experience here on Earth. The planet also experiences dust storms, which can turn into what resembles small tornadoes. Larger dust storms occur when the dust is blown into the atmosphere and heats up from the Sun. The warmer dust filled air rises and the winds get stronger, creating storms that can measure up to thousands of kilometers in width and last for

months at a time. When they get this large, they can actually block most of the surface from view. Trace amounts of methane have also been detected in the Martian atmosphere, with an estimated concentration of about 30 parts per billion ppb. Once released into the atmosphere, the methane can only exist for a limited period of time 0. Its presence despite this short lifetime indicates that an active source of the gas must be present. Several possible sources have been suggested for the presence of this methane, ranging from volcanic activity, cometary impacts, and the presence of methanogenic microbial life forms beneath the surface. Methane could also be produced by a non-biological process called serpentinization involving water, carbon dioxide, and the mineral olivine, which is known to be common on Mars. The Curiosity rover has made several measurements for methane since its deployment to the Martian surface in August of The first measurements, which were made using its Tunable Laser Spectrometer TLS , indicated that there were less than 5 ppb at its landing site Bradbury Landing. A subsequent measurement performed on September 13th detected no discernible traces. Samples measurements taken between late and early showed an increase of 7 ppb; whereas before and after that, readings averaged around one-tenth that level. Regions where methane appears notably localized in Northern Summer and their relationship to mineralogical and geo-morphological domains. Ammonia was also tentatively detected on Mars by the Mars Express satellite, but with a relatively short lifetime. It is not clear what produced it, but volcanic activity has been suggested as a possible source. In essence, they deduced that the planet, though it appeared to be a bright star, moved differently than the other stars, and that it would occasionally slow down and reverse course before returning to its original course. By the time of the Neo-Babylonian Empire BCE â€" BCE , astronomers were making regular records of the position of the planets, systematic observations of their behavior and even arithmetic methods for predicted the positions of the planets. For Mars, this included detailed accounts of its orbital period and its passage through the zodiac. In the 4th century BCE, Aristotle noted that Mars disappeared behind the Moon during an occultation, which indicated it was farther away than the Moon. Illustration of the Ptolemaic geocentric conception of the Universe by Portuguese cosmographer and cartographer Bartolomeu Velho from his work Cosmographia This became the authoritative treatise on Western astronomy for the next fourteen centuries. The Ptolemaic model of the Solar System remained canon for western astronomers until the Scientific Revolution 16th to 18th century CE. The invention of the telescope also allowed astronomers to measure the diurnal parallax of Mars and determine its distance. This was first performed by Giovanni Domenico Cassini in , but his measurements were hampered by the low quality of his instruments. During the 17th century, Tycho Brahe also employed the diurnal parallax method, and his observations were measured later by Johannes Kepler. During this time, Dutch astronomer Christiaan Huygens also drew the first map of Mars which included terrain features. Wikipedia Commons By the 19th century, the resolution of telescopes improved to the point that surface features on Mars could be identified. This led Italian astronomer Giovanni Schiaparelli to produce the first detailed map of Mars after viewing it at opposition on September 5th, These maps notably contained features he called canali â€" a series of long, straight lines on the surface of Mars â€" which he named after famous rivers on Earth. Lowell published several books on Mars and life on the planet, which had a great influence on the public, and the canals were also observed by other astronomers, like Henri Joseph Perrotin and Louis Thollon of Nice. Seasonal changes like the diminishing of the polar caps and the dark areas formed during Martian summer, in combination with the canals, led to speculation about life on Mars. Even in the s, articles were published on Martian biology, putting aside explanations other than life for the seasonal changes on Mars. With the advent of the space age, probes and landers began to be sent to Mars by the late 20th century. These have yielded a wealth of information on the geology, natural history, and even the habitability of the planet, and increased our knowledge of the planet immensely. And while modern missions to Mars have dispelled the notions of there being a Martian civilization, they have indicated that life may have existed there at one time. Efforts to explore Mars began in earnest in the s. Between and , the Soviets launched nine unmanned spacecraft towards Mars, but all failed to reach the planet. This began with Mariner 3 and Mariner 4, two unmanned probes that were designed to carry out the first flybys of Mars. Mariner 4 captured the first close-up photographs of another planet showing impact craters and provided accurate data about the surface atmospheric pressure, and noted the absence of a Martian magnetic field and

radiation belt. NASA continued the Mariner program with another pair of flyby probes â€" Mariner 6 and 7 â€" which reached the planet in During the s, the Soviets and the US competed to see who could place the first artificial satellite in orbit of Mars. The first, a heavy orbiter, failed during launch. The subsequent missions, Mars 2 and Mars 3, were combinations of an orbiter and a lander, and would be the first rovers to land on a body other than the Moon. They were successfully launched in mid-May and reached Mars about seven months later. On November 27th, , the lander of Mars 2 crash-landed due to an on-board computer malfunction and became the first man-made object to reach the surface of Mars. In December 2nd, , the Mars 3 lander became the first spacecraft to achieve a soft landing, but its transmission was interrupted after Mariner 8 also suffered a technical failure during launch and crashed into the Atlantic Ocean. But the Mariner 9 mission managed to not only make it to Mars, but became the first spacecraft to successfully establish orbit around it. Along with Mars 2 and Mars 3, the mission coincided with a planet-wide dust storm. During this time, the Mariner 9 probe managed to rendezvous and take some photos of Phobos. When the storm cleared sufficiently, Mariner 9 took photos that were the first to offer more detailed evidence that liquid water might have flowed on the surface at one time. Nix Olympica, which was one of only a few features that could be seen during the planetary duststorm, was also determined to be the highest mountain on any planet in the entire Solar System, leading to its reclassification as Olympus Mons. In , the Soviet Union sent four more probes to Mars:

Chapter 5 : Mars' Atmosphere: Composition, Climate & Weather

Mars planet facts and information. Compare Earth & Mars. Fun science images for kids, school, family & space fans. Mars in space, night sky & history.

Like the rest of the planets in the solar system except Earth , Mars is named after a mythological figure - the Roman god of war. In addition to its official name, Mars is sometimes called the Red Planet because of the brownish-red color of its surface. Mars is the second smallest planet in the solar system behind Mercury. Size of Mars compared to the Earth Side by side comparison of the size of Mars vs Earth Facts about Mars Mars is the fourth planet from the Sun and last of the terrestrial planets and is around ,, km from the Sun. The planet is named after Mars, the Roman god of war. It was known to the ancient Greeks as Ares, their god of war. This is thought to be because of the blood-red color of the planet which was also used by other ancient cultures. The landmass of Mars and Earth is very similar. This means that on Mars you could in theory jump 3x higher than you could on Earth. Only 16 of the 39 Mars missions have been successful. Pieces of Mars have been found on Earth. It is believed that trace amounts of the Martian atmosphere were within meteorites that the planet ejected. The study of this material has allowed scientists to discover more about Mars before launching space missions. Mars was once believed to be home to intelligent life. This came from the discovery of lines or grooves in the surface called canali by Italian astronomer Giovanni Schiaparelli. He believed that these were not naturally occurring and were proof of intelligent life. However, these were later shown to be an optical illusion. The tallest mountain known in the solar system is on Mars. Olympus Mons is a 21 km high and km diameter shield volcano that was formed billions of years ago. Scientists have found a lot of recent evidence of volcanic lava which suggests Olympus Mons may still be active. It is the second highest mountain in the entire solar system, topped only by the Rheasilvia central peak on the asteroid Vesta, which is 22 km high. Mars experiences huge dust storms â€" the largest in our solar system. The orbit path is more elongated than many of the other planets and this oval shaped orbit results in fierce dust storms that cover the entire planet and can last for many months. The Sun looks about half its size half it does from Earth when seen from Mars. When Mars is closest to the Sun in its orbit the southern hemisphere points toward the Sun and this causes a very short but fiercely hot summer. In the north it experiences a brief but cold winter. When the planet is farthest from the Sun, Mars experiences a long and mild summer because the northern hemisphere points toward the Sun. This is compared with a cold and lengthy winter in the south. With the exception of Earth, Mars is the most hospitable to life â€" a number of space missions are planning for the next decade the further increase our understanding of Mars and when it has the potential for extraterrestrial life, as well as whether it may be a viable planet for a colony. Martians, also known as extraterrestrials from Mars, are a common character in science fiction books and movies. This makes Mars one of the most popular and talked about planets in the solar system. It takes Mars Earth days to orbit the Sun with its orbit radius of ,, km. Mars is the only other planet besides Earth that has polar ice caps. The northern cap is called the Planum Boreum, with Planum Australe in the south. Water ice has also been found under the Martian ice caps. Mars has seasons like Earth, but they last twice as long. This is because Mars is tilted on its axis by about The orbit of Mars is the most eccentric of the eight planets. This means it is the least circular orbit path of the planets. Mars does not have a magnetic field â€" although there are some scientists that believe it did have a magnetic field somewhere around 4 billion years ago. More information and facts about Mars It was believed life existed on Mars for much of the nineteenth century. The reason behind this belief was part mistake and part imagination. As others noticed these lines, some suggested that they were too straight and could only be the work of intelligent life. The popular conclusion as to the nature of these lines was that they were canals constructed for irrigation purposes. However, with the development of more powerful telescopes in the early twentieth century, astronomers were able to view the Martian surface more clearly and determine that these straight lines were merely an optical illusion. As a result, the earlier claims of life on Mars were without evidence and, therefore, discarded. The large amount of science fiction written during the twentieth century was a direct outgrowth of the belief that Mars possessed life. From little green men to death rays, Martians were the focus

of many television and radio programs, comic books, movies, and novels. Although the discovery of Martian life in the eighteenth century eventually proved to be false, Mars is nonetheless the planet most hospitable for life other than the Earth. The Viking mission in the s conducted experiments on the Martian soil in hopes of detecting microorganisms. While it was initially believed that the formation of compounds during the experiments were a result of biological agents, it has since been determined that these compounds can be created without biological mechanisms. Future planetary missions scheduled to test the possibility of past and present life include the Mars Science Laboratory and ExoMars missions. Thus, something other than the composition is at work. The huge difference lies in the density of the two atmospheres. Simply put, Mars would resemble Venus if it possessed a thicker atmosphere. One of the long standing areas of research regarding the Martian atmosphere is its impact on the presence of liquid water. Surprisingly, despite the thin atmosphere, Mars experiences weather patterns. The primary form of this weather consists of winds, with other manifestations that include dust storms, frost, and fog. As a final note on the Martian atmosphere, leading theories claim that it may have once been dense enough to support large oceans of water. One popular explanation for this change is that Mars was struck by a large body and in the process a large portion of its atmosphere was ejected into space. The northern hemisphere is seen to be relatively smooth with few craters, whereas the southern hemisphere is an area of highlands that are more heavily cratered than the northern plains. Other than topographical differences, the distinguishing feature of the two regions appears to be geological activity, with the northen plains being much more active. The Martian surface is home to both the largest known volcano, Olympus Mons, and largest known canyon, Valles Marineris, in the Solar System. With a height of 25 km and a base diameter of km, Olympus Mons is three times the height of Mt. Everest, the tallest mountain on the Earth. Valles Marineris is 4, km long, km wide, and almost 7 km deep. To put the shear magnitude of its size into perspective, Valles Marineris would stretch from the East to West coast of the United States. Perhaps the most significant discovery regarding the Martian surface was the presence of channels. What is so meaningful about these channels is that they appear to have been created by running water, and thus providing evidence to support the theory that Mars could have been much more similar to the Earth at one time. However, subsequent images showed that lighting and a little imagination are what brought life to the formation. Estimates put its thickness in the northern hemisphere at 35 km, and 80 km in the southern hemisphere. Some scientists point to the lack of a significant magnetic field as an indication that the core is solid. However, within the past decade much data has been gathered to indicate that the core is at least partially liquid. The cause for this change is attributed to the gravitational forces exerted upon Mars by neighboring planets. This, of course, is due to its orbital distance. One Martian year is equal to almost Earth days. It takes Mars about 24 hours 40 minutes to complete one full rotation, easily making the Martian day the closest in length to an Earth day. What this means is Mars actually experiences seasons like those on Earth, though each is substantially longer because of the orbital distance of Mars.

DOWNLOAD PDF 25. OF THE PLANET MARS

Chapter 6 : Mars: Evidence detected of lake beneath planet's surface - CNN

Mars is the fourth planet from the Sun and the seventh www.nxgvision.com (Greek: Ares) is the god of War. The planet probably got this name due to its red color; Mars is sometimes referred to as the Red Planet.

Download Questions about Mars all answers found on this page It is easy to forget that Earth is not the only planet in the solar system. Seven or eight if you include Pluto other planets whiz around the sun just like ours. Of those planets, none of them are closer or more engaging to the imagination than Mars. The Red Planet, as Mars is often called, is the fourth planet from the sun Earth is the third. In a lot of ways, Mars looks a lot like our home, though instead of blue oceans and green land, Mars is home to an ever present red tint. However, when you look past the surface differences, these two planets are similar in a lot of ways. Here are just a few: Also like Earth, both ice caps are made mostly of frozen water. With so much water frozen in the ice caps of Mars, some scientists think that life could have once existed there. Length of a Year â€" Mars is not much farther from the Sun than Earth. As a result, a typical year on Mars is 1 year and days. Length of a Day â€" While a year on Mars might be almost twice as long as a year on Earth, the length of a day there is almost identical. A Martian day is 24 hours and 39 minutes long, less than an hour longer than a day on Earth. Seasons â€" Mars has seasons like Earth too. These seasons are much longer than Earth seasons because Mars is so much farther from the sun. A lot of planets are bigger than Earth. For example, Earths could fit inside of Jupiter. Mars is not quite so big. In fact, Mars is one of only two planets in the solar system to be significantly smaller than Earth. If you looked at the two planets side by side, Earth would be a basketball while Mars is a softball. The surface of Mars is filled with exciting locations. Here are a few fun facts about Mars: It is so big that astronomers could see it through telescopes in the 19th century, almost years ago! If you look at a picture of Mars taken from a telescope, you will see the giant gash that is Valles Marineris. Mars is covered by craters from objects like asteroids and meteorites hitting the planet. Today, 43, such craters have been found and that only includes the large ones! As a result, the temperature on Mars regularly drops to degrees F degrees C in the winter and only rises to 23 degrees F -5 degrees C in the summer. The dust storms on Mars are larger than on any other planet in the solar system. Some dust storms on Mars can blanket almost the entire planet in just a few days Mars is an incredible planet. With mountains, craters and caverns like Earth and a rich history, we will be learning more about the Red Planet for centuries to come.

Chapter 7 : 25 amazing photos of Mars

This feature is not available right now. Please try again later.

Winter Weather Mars is the last planet of the inner four terrestrial planets in the solar system at an average distance of million miles from our Sun. It revolves around the Sun every days and rotates every Mars has two tiny satellites, named Deimos and Phobos shown below. Deimos and Phobos have diameters of just 7 miles and 14 miles, respectively. An interesting side note; the inner moon, Phobos, makes a revolution around Mars in slightly more than seven hours. This means since it orbits Mars faster than the planet rotates, the satellite rises in the west and sets in the east if observed from the Martian surface. The Martian atmosphere is composed primarily of carbon dioxide. However unlike Venus, the Mars atmosphere is very thin, subjecting the planet to a bombardment of cosmic rays and producing very little greenhouse effect. Temperatures on Mars average about degrees F. Various probes over the past few decades have found the surface of Mars to be rather desert like. A fascinating panoramic view of the martian surface was taken picture below in by the Pathfinder mission. The surface is cratered, but not as much as our Moon or Mercury. The craters have probably been weather worn over the years by fierce windstorms, some of which can cover the entire planet. These windstorms are common on the red planet, lifting rust-colored dust well up into the atmosphere encircling the entire globe. The rest of Mars has patches of green. But it is not clear what is producing this green color as it certainly is not vegetation. Evidence does exist in the terrain that water has eroded some of the soil. No flowing water is present today, but NASA announced on March 2, that the two rovers, Spirit and Opportunity confirmed liquid water once flowed on Mars. The meteorite was dated back 4. No precipitation falls however. At the Viking II Lander site, frost covered the ground each winter. Seasons do exist on Mars, as the planet tilts on its axis about 25 degrees. White caps of water ice and carbon dioxide ice shrink and grow with the progression of winter and summer at the poles. Evidence of climatic cycles exists, as water ice is formed in layers with dust between them. In addition, features near the south pole may have been produced by glaciers which are no longer present. Mars does have many terrain features similar to Earth, such as canals, canyons, mountains and volcanoes. Mars has a prominent volcano named Olympus Mons, which stands 69, feet above the Martian surface. This makes it the tallest mountain known in our solar system. In general, Mars has highly variable weather and is often cloudy. The planet swings from being warm and dusty to cloudy and cold. Mars long ago was likely a warmer, wetter planet with a thicker atmosphere, able to sustain oceans or seas.

Chapter 8 : Mars Facts: Interesting Facts about Planet Mars â€¢ The Planets

Mars is the fourth planet from the Sun and last of the terrestrial planets and is around ,, km from the Sun. The planet is named after Mars, the Roman god of war. It was known to the ancient Greeks as Ares, their god of war.

Besides silicon and oxygen, the most abundant elements in the Martian crust are iron, magnesium , aluminum , calcium , and potassium. Surface geology Main article: Geology of Mars Mars is a terrestrial planet that consists of minerals containing silicon and oxygen , metals , and other elements that typically make up rock. The surface of Mars is primarily composed of tholeiitic basalt , [40] although parts are more silica -rich than typical basalt and may be similar to andesitic rocks on Earth or silica glass. Regions of low albedo suggest concentrations of plagioclase feldspar , with northern low albedo regions displaying higher than normal concentrations of sheet silicates and high-silicon glass. Parts of the southern highlands include detectable amounts of high-calcium pyroxenes. Localized concentrations of hematite and olivine have been found. Mars has many distinctive chemical features caused by its position in the Solar System. Formation of the oldest extant surfaces of Mars, 4. Noachian age surfaces are scarred by many large impact craters. The Tharsis bulge, a volcanic upland, is thought to have formed during this period, with extensive flooding by liquid water late in the period. Hesperian period named after Hesperia Planum: The Hesperian period is marked by the formation of extensive lava plains. Amazonian period named after Amazonis Planitia: Amazonian regions have few meteorite impact craters, but are otherwise quite varied. Olympus Mons formed during this period, with lava flows elsewhere on Mars. Geological activity is still taking place on Mars. The Athabasca Valles is home to sheet-like lava flows created about Mya. Water flows in the grabens called the Cerberus Fossae occurred less than 20 Mya, indicating equally recent volcanic intrusions. Martian soil Exposure of silica-rich dust uncovered by the Spirit rover The Phoenix lander returned data showing Martian soil to be slightly alkaline and containing elements such as magnesium , sodium , potassium and chlorine. These nutrients are found in soils on Earth, and they are necessary for growth of plants. The streaks are dark at first and get lighter with age. The streaks can start in a tiny area, then spread out for hundreds of metres. They have been seen to follow the edges of boulders and other obstacles in their path. The commonly accepted theories include that they are dark underlying layers of soil revealed after avalanches of bright dust or dust devils. Radar data from Mars Express and the Mars Reconnaissance Orbiter show large quantities of water ice at both poles July [66] [67] and at middle latitudes November Huge linear swathes of scoured ground, known as outflow channels , cut across the surface in about 25 places. These are thought to be a record of erosion caused by the catastrophic release of water from subsurface aquifers, though some of these structures have been hypothesized to result from the action of glaciers or lava. Features of these valleys and their distribution strongly imply that they were carved by runoff resulting from precipitation in early Mars history. Subsurface water flow and groundwater sapping may play important subsidiary roles in some networks, but precipitation was probably the root cause of the incision in almost all cases. A number of authors have suggested that their formation process involves liquid water, probably from melting ice, [75] [76] although others have argued for formation mechanisms involving carbon dioxide frost or the movement of dry dust. Further evidence that liquid water once existed on the surface of Mars comes from the detection of specific minerals such as hematite and goethite , both of which sometimes form in the presence of water. This forms only in the presence of acidic water, which demonstrates that water once existed on Mars. The Phoenix lander directly sampled water ice in shallow Martian soil on July 31, This finding was derived from the ratio of water to deuterium in the modern Martian atmosphere compared to that ratio on Earth. The amount of Martian deuterium is eight times the amount that exists on Earth, suggesting that ancient Mars had significantly higher levels of water. Results from the Curiosity rover had previously found a high ratio of deuterium in Gale Crater , though not significantly high enough to suggest the former presence of an ocean. Other scientists caution that these results have not been confirmed, and point out that Martian climate models have not yet shown that the planet was warm enough in the past to support bodies of liquid water. These seasonal actions transport large amounts of dust and water vapor, giving rise to Earth-like frost and large cirrus clouds. Clouds of water-ice were photographed by the Opportunity

rover in Frozen carbon dioxide accumulates as a comparatively thin layer about one metre thick on the north cap in the northern winter only, whereas the south cap has a permanent dry ice cover about eight metres thick. This permanent dry ice cover at the south pole is peppered by flat floored, shallow, roughly circular pits , which repeat imaging shows are expanding by meters per year; this suggests that the permanent CO2 cover over the south pole water ice is degrading over time. With the arrival of spring, sunlight warms the subsurface and pressure from subliming CO2 builds up under a slab, elevating and ultimately rupturing it. This leads to geyser-like eruptions of CO2 gas mixed with dark basaltic sand or dust. This process is rapid, observed happening in the space of a few days, weeks or months, a rate of change rather unusual in geology â€” especially for Mars. The gas rushing underneath a slab to the site of a geyser carves a spiderweb-like pattern of radial channels under the ice, the process being the inverted equivalent of an erosion network formed by water draining through a single plughole. Volcanic plateaus delimit regions of the northern plains, whereas the highlands are punctuated by several large impact basins. These new impact craters on Mars occurred sometime between and , as detected from orbit.

Chapter 9 : Mars Facts - Planet Mars - Mars For Kids

Mars, otherwise known as the "Red Planet", is the fourth planet of our Solar System and the second smallest (after Mercury). Named after the Roman God of war, its nickname comes from its.