

Chapter 1 : SparkNotes: Albert Einstein: Timeline

Inventions, research work, or findings that led to inventions, all of these discoveries fall under Albert Einstein accomplishments, and his contributions helped scientists that followed, to further the knowledge and advancements.

The case, "Why is the sky blue? The general theory is principally concerned with the large-scale effects of gravitation and therefore is an essential ingredient in theories of the universe as a whole, or cosmology. The theory recognizes the equivalence of gravitational and inertial mass. It asserts that material bodies produce curvatures in space-time that form a gravitational field and that the path of a body in the field is determined by this curvature. In other words, according to this theory, space becomes curved in the vicinity of matter this is the meaning of gravity ; the greater the concentration of matter, the greater the curvature and the greater the gravity. The geometry of a given region of space and the motion in the field can be predicted from the equations of the general theory. Nobel Prize On December 10, , Einstein received the Nobel prize in physics for the year , especially for his discovery of the law of the photoelectric effect see above. In the Indian physicist Satyendra Nath Bose sent Einstein a paper in which he derived the Planck law for black-body radiation by treating the photons as a gas of identical particles. We now know that this phenomenon, BEC , only happens for "bosons". What does it mean to say that atoms overlap? As a gas becomes colder and colder, quantum mechanics tells us that the wavelike behavior of the atoms becomes more and more important. At the lowest temperatures, within a few hundred billionths of absolute zero In this state, it hardly even makes sense to talk about individual atoms because they all behave as one collective object. In recent developments, BECs are being used to create atom lasers, the equivalent of a laser made of light; in the study of superconductivity the ability of some materials to conduct electrical current without any resistance ; superfluidity the ability of some materials to flow without resistance and in refining measurements of time and distance. Einstein Refrigerator Only few know that Albert Einstein was also a practical man and invented a refrigerator. The Einstein refrigerator is an absorption refrigerator which has no moving parts and requires only a heat source to operate - it does not require electricity to operate, needing only a heat source, e. Although Einstein did not invent the bomb and did not participate in the Manhattan Project, his theories laid the foundation for it. In Einstein collaborated with several other physicists in writing a letter to President Franklin D. Roosevelt, pointing out the possibility of making an atomic bomb and the likelihood that the German government was embarking on such a course. Albert Einstein Died in Einstein Links.

Chapter 2 : What did Albert Einstein invent? | HowStuffWorks

The Albert Einstein inventions/theories were of great help to scientists of 20th century. The theory of relativity as proposed by this famous scientist can be considered a milestone in the history of scientific development.

Check new design of our homepage! So what did Albert Einstein invent? ScienceStruck Staff Last Updated: The Einstein refrigerator is an important invention by Albert Einstein. The theory of relativity proposed by Einstein is one of his important contributions to the study of the physical world. Most of the inventions by Einstein may not be considered as inventions in the conventional sense. The history of inventions of Einstein shows that most of his inventions were theoretical concepts which laid the foundation for further research on the subject. Albert Einstein invented this refrigerator with the help of Leo Szilard, a former student. The Einstein Refrigerator was patented on 11th November, The main objective of Einstein and Szilard in developing this refrigerator was to make improvements to the home refrigeration technology. The news of an accident, which took place as a result of breaking of a refrigerator seal inspired Einstein and Szilard to find a safe alternative to the technology used in those days. Contribution to Theoretical Study of Nuclear Physics One cannot say that Einstein was directly involved in the invention of the atomic bomb. One should however, note that Einstein was not a member of the team which developed the atomic bomb. In fact, he had written to the US President Roosevelt urging him to build an atomic bomb before the invasive Germans attempted to do so. However, he also condemned the use of atomic bomb by USA - which led to mass destruction and bloodshed in Hiroshima, Japan. The Special Theory of Relativity This theory was developed by Albert Einstein in his attempt to reconcile the laws of electromagnetic field with those of classical mechanics. The two fundamental concepts given below form the essence of this theory. General Theory of Relativity The research that was conducted on the Theory of Relativity was amongst the major accomplishments by Albert Einstein. In this regard, an important postulate put forth by Einstein is stated as follows, "gravitational fields are equivalent to the accelerations of the frame of reference". This postulate can be elaborated with the help of the following example. People in an elevator one that is descending are unable to understand exactly which force gravitational force or acceleration of elevator governs their motion. Photoelectric Effect In one of his papers on the subject of photoelectric effect, Einstein stated that light is made up of particles. In this paper he also stated that these light particles photons contain energy. The energy present in photons is directly proportional to frequency of radiation. Earlier, it was assumed by scientists that light traveled in the form of waves. The studies conducted by Einstein and discoveries made by him helped in understanding some of the basic concepts of physics. In , Albert Einstein was awarded the Nobel Prize for his research on the subject of photoelectric effect. The relation between energy and radiation frequency is presented with the help of the formula is given below.

Chapter 3 : Can you give me a list of inventions that Albert Einstein Invented

The Einstein refrigerator is an important invention by Albert Einstein. The theory of relativity proposed by Einstein is one of his important contributions to the study of the physical world. Most of the inventions by Einstein may not be considered as inventions in the conventional sense.

Six weeks later the family moved to Munich, where he later on began his schooling at the Luitpold Gymnasium. Later, they moved to Italy and Albert continued his education at Aarau, Switzerland and in he entered the Swiss Federal Polytechnic School in Zurich to be trained as a teacher in physics and mathematics. In , the year he gained his diploma, he acquired Swiss citizenship and, as he was unable to find a teaching post, he accepted a position as technical assistant in the Swiss Patent Office. During his stay at the Patent Office, and in his spare time, he produced much of his remarkable work and in he was appointed Privatdozent in Berne. In he became Professor Extraordinary at Zurich, in Professor of Theoretical Physics at Prague, returning to Zurich in the following year to fill a similar post. He became a United States citizen in and retired from his post in Chaim Weizmann in establishing the Hebrew University of Jerusalem. Einstein always appeared to have a clear view of the problems of physics and the determination to solve them. He had a strategy of his own and was able to visualize the main stages on the way to his goal. He regarded his major achievements as mere stepping-stones for the next advance. At the start of his scientific work, Einstein realized the inadequacies of Newtonian mechanics and his special theory of relativity stemmed from an attempt to reconcile the laws of mechanics with the laws of the electromagnetic field. He dealt with classical problems of statistical mechanics and problems in which they were merged with quantum theory: He investigated the thermal properties of light with a low radiation density and his observations laid the foundation of the photon theory of light. In his early days in Berlin, Einstein postulated that the correct interpretation of the special theory of relativity must also furnish a theory of gravitation and in he published his paper on the general theory of relativity. During this time he also contributed to the problems of the theory of radiation and statistical mechanics. In the s, Einstein embarked on the construction of unified field theories, although he continued to work on the probabilistic interpretation of quantum theory, and he persevered with this work in America. He contributed to statistical mechanics by his development of the quantum theory of a monatomic gas and he has also accomplished valuable work in connection with atomic transition probabilities and relativistic cosmology. After his retirement he continued to work towards the unification of the basic concepts of physics, taking the opposite approach, geometrisation, to the majority of physicists. Among his non-scientific works, *About Zionism* , *Why War?* Albert Einstein received honorary doctorate degrees in science, medicine and philosophy from many European and American universities. He gained numerous awards in recognition of his work, including the Copley Medal of the Royal Society of London in , and the Franklin Medal of the Franklin Institute in He died on April 18, at Princeton, New Jersey. It was later edited and republished in *Nobel Lectures*. To cite this document, always state the source as shown above.

Chapter 4 : Albert Einstein: After the Doctorate | HowStuffWorks

Albert Einstein, a man whose name is practically synonymous with genius, is one of history's greatest thinkers. As a physicist and mathematician, Einstein wasn't an inventor in the vein of Thomas Edison or Alexander Graham Bell, but his theories of relativity led to new ways of looking at time, space, matter, energy and gravity.

Conrad Habicht, Maurice Solovine and Einstein. After graduating in 1905, Einstein spent almost two frustrating years searching for a teaching post. He acquired Swiss citizenship in February 1906, but for medical reasons was not conscripted. Academic career By 1909, he was recognized as a leading scientist and was appointed lecturer at the University of Bern. Einstein was appointed associate professor in 1911. From 1911 until 1913, he was professor of theoretical physics at the ETH Zurich, where he taught analytical mechanics and thermodynamics. He also studied continuum mechanics, the molecular theory of heat, and the problem of gravitation, on which he worked with mathematician and friend Marcel Grossmann. Max Planck and Walther Nernst visited him the next week in Zurich to persuade him to join the academy, additionally offering him the post of director at the Kaiser Wilhelm Institute for Physics, which was soon to be established. He was officially elected to the academy on 24 July, and he accepted to move to the German Empire the next year. His decision to move to Berlin was also influenced by the prospect of living near his cousin Elsa, with whom he had developed a romantic affair. He joined the academy and thus the Berlin University on 1 April. The institute was established on 1 October, with Einstein as its director. In 1915, that prediction was confirmed by Sir Arthur Eddington during the solar eclipse of 29 May. Those observations were published in the international media, making Einstein world famous. On 7 November, the leading British newspaper *The Times* printed a banner headline that read: *Travels abroad Albert Einstein* at a session of the International Committee on Intellectual Cooperation League of Nations of which he was a member from 1912 to 1918. Einstein visited New York City for the first time on 2 April 1919, where he received an official welcome by Mayor John Francis Hylan, followed by three weeks of lectures and receptions. He went on to deliver several lectures at Columbia University and Princeton University, and in Washington he accompanied representatives of the National Academy of Science on a visit to the White House. The American is friendly, self-confident, optimistic, and without envy. After his first public lecture, he met the emperor and empress at the Imperial Palace, where thousands came to watch. In a letter to his sons, he described his impression of the Japanese as being modest, intelligent, considerate, and having a true feel for art. In his place, the banquet speech was held by a German diplomat, who praised Einstein not only as a scientist but also as an international peacemaker and activist. He was greeted as if he were a head of state, rather than a physicist, which included a cannon salute upon arriving at the home of the British high commissioner, Sir Herbert Samuel. During one reception, the building was stormed by people who wanted to see and hear him. Travel to the US In December 1921, Einstein visited America for the second time, originally intended as a two-month working visit as a research fellow at the California Institute of Technology. After the national attention he received during his first trip to the US, he and his arrangers aimed to protect his privacy. Although swamped with telegrams and invitations to receive awards or speak publicly, he declined them all. During the days following, he was given the keys to the city by Mayor Jimmy Walker and met the president of Columbia University, who described Einstein as "the ruling monarch of the mind". His friendship with Millikan was "awkward", as Millikan "had a penchant for patriotic militarism," where Einstein was a pronounced pacifist. Carl Laemmle, head of Universal Studios, gave Einstein a tour of his studio and introduced him to Chaplin. They had an instant rapport, with Chaplin inviting Einstein and his wife, Elsa, to his home for dinner. Chaplin speculated that it was "possibly used as kindling wood by the Nazis. He is rolling up his sleeves and holding a sword labeled "Preparedness" by Charles R. He and his wife Elsa returned to Belgium by ship in March, and during the trip they learned that their cottage was raided by the Nazis and his personal sailboat confiscated. Upon landing in Antwerp on 28 March, he immediately went to the German consulate and surrendered his passport, formally renouncing his German citizenship. In April 1933, Einstein discovered that the new German government had passed laws barring Jews from holding any official positions, including teaching at universities. I must confess that the degree of their brutality and cowardice

came as something of a surprise. He rented a house in De Haan, Belgium, where he lived for a few months. In late July, he went to England for about six weeks at the personal invitation of British naval officer Commander Oliver Locker-Lampson, who had become friends with Einstein in the preceding years. To protect Einstein, Locker-Lampson had two assistants watch over him at his secluded cottage outside London, with photo of them carrying shotguns and guarding Einstein, published in the Daily Herald on 24 July. British historian Martin Gilbert notes that Churchill responded immediately, and sent his friend, physicist Frederick Lindemann, to Germany to seek out Jewish scientists and place them in British universities. He had offers from several European universities, including Christ Church, Oxford where he stayed for three short periods between May and June and was offered a 5-year studentship, [] [] but in he arrived at the decision to remain permanently in the United States and apply for citizenship. The two would take long walks together discussing their work. Bruria Kaufman, his assistant, later became a physicist. During this period, Einstein tried to develop a unified field theory and to refute the accepted interpretation of quantum physics, both unsuccessfully.

Chapter 5 : What Did Albert Einstein Invent?

Albert Einstein, along with Max Plack explained that light can have attributes of a wave or a particle, based on circumstance. This theory is known as: Wave-Particle Duality.

WhatsApp Albert Einstein contributed, perhaps more than any man in history, in the development of our world. Here are 10 major accomplishments of the great scientist. In 1905, Albert Einstein published a paper on the random motion of particles in a fluid, known as Brownian motion. Einstein explained in precise detail how the motion that Brown had observed was a result of the pollen being moved by individual water molecules. A Diagram of Brownian Motion 3 Einstein solved the riddle of the photoelectric effect Photoelectric Effect is the emissions of electrons from a metal when light shines on it. In his revolutionary paper, released on June 9, 1905, Einstein challenged the wave theory of light and suggested that light could also be regarded as a collection of discrete energy packets photons. Millikan about a decade later. Quantum mechanics in turn explained many features of our universe and is used a great deal in modern technological inventions. Einstein proposed major changes to mechanics while handling situations close to the speed of light. It was supported by confirmatory experimental evidence and soon gained widespread acceptance. As of today, special relativity is the most accurate model of motion at any speed. It implied that gravity had the ability to bend light and could be used to calculate the amount of energy released or consumed during nuclear reactions. General relativity helped to model the large-scale structure of the universe and its predictions have been confirmed in all observations and experiments to date. It has developed into an essential tool in modern astrophysics providing understanding of phenomena like black holes and gravitational lensing. Einstein submitted the German translation of the paper to a journal. In collaboration with Bose, Einstein extended the idea to atoms and this led to the prediction of the existence of phenomena which became known as Bose-Einstein condensate. It was not until that the first such condensate was produced experimentally. These debates are remembered as they are considered important to the philosophy of science. They not only represented one of the highest points of scientific research in the first half of the twentieth century but they also brought to focus an element of quantum theory, namely quantum non-locality, which is absolutely essential in our modern understanding of the physical world. In 1921, he was awarded the Copley Medal by the Royal Society, which is perhaps the oldest surviving scientific award in the world. His impact is not just restricted to science it can be seen in other fields like philosophy, visual arts and literature. Philosophical movement logical positivism, art movement Cubism and numerous science fiction novels bear the imprint of Einstein. Albert Einstein changed the world perhaps more than anyone has ever done in its history.

Chapter 6 : Albert Einstein - Wikipedia

Only few know that Albert Einstein was also a practical man and invented a refrigerator. The Einstein refrigerator is an absorption refrigerator which has no moving parts and requires only a heat source to operate - it does not require electricity to operate, needing only a heat source, e.g. a small gas burner, suitable for poor countries and.

Visit Website While at Zurich Polytechnic, Einstein fell in love with his fellow student Mileva Maric, but his parents opposed the match and he lacked the money to marry. The couple had an illegitimate daughter, Lieserl, born in early , of whom little is known. After finding a position as a clerk at the Swiss patent office in Bern, Einstein married Maric in ; they would have two more children, Hans Albert born and Eduard born In the first paper, he applied the quantum theory developed by German physicist Max Planck to light in order to explain the phenomenon known as the photoelectric effect, by which a material will emit electrically charged particles when hit by light. To do this, Einstein introduced his special theory of relativity, which held that the laws of physics are the same even for objects moving in different inertial frames i. A fourth paper concerned the fundamental relationship between mass and energy, concepts viewed previously as completely separate. From Zurich to Berlin Einstein continued working at the patent office until , when he finally found a full-time academic post at the University of Zurich. In , he arrived at the University of Berlin, where he was made director of the Kaiser Wilhelm Institute for Physics. In , Einstein published the general theory of relativity, which he considered his masterwork. This theory found that gravity, as well as motion, can affect time and space. In , two expeditions sent to perform experiments during a solar eclipse found that light rays from distant stars were deflected or bent by the gravity of the sun in just the way Einstein had predicted. In , he won the Nobel Prize for his work on the photoelectric effect, as his work on relativity remained controversial at the time. Einstein soon began building on his theories to form a new science of cosmology, which held that the universe was dynamic instead of static, and was capable of expanding and contracting. Einstein Moves to the United States A longtime pacifist and a Jew, Einstein became the target of hostility in Weimar Germany, where many citizens were suffering plummeting economic fortunes in the aftermath of defeat in the Great War. In December , a month before Adolf Hitler became chancellor of Germany, Einstein made the decision to emigrate to the United States, where he took a position at the newly founded Institute for Advanced Study in Princeton, New Jersey. He would never again enter the country of his birth. In the process, Einstein became increasingly isolated from many of his colleagues, who were focused mainly on the quantum theory and its implications, rather than on relativity. Roosevelt advising him to approve funding for the development of uranium before Germany could gain the upper hand. Einstein, who became a U. Throughout the last years of his life, Einstein continued his quest for a unified field theory. Though he published an article on the theory in Scientific American in , it remained unfinished when he died, of an aortic aneurysm, five years later.

Albert Einstein invented the technology used for an atomic bomb. he discovered that $E=MC^2$ and he also discovered that light is the fastest thing ever.

March 14, Ulm, in Germany Died: Albert Einstein was a scientist in the early s. He came up with some of the most important discoveries and theories in all of science. Some people consider him to be one of the smartest people of the 20th century. His face and name are often used as the picture or description of the consummate scientist. Read here to learn more about Albert Einstein; what he was like and what discoveries and inventions he made. Albert Einstein was born in Ulm, Germany on March 14, He spent most of his childhood in Munich, Germany. His father had an electronics company and Albert learned a lot about science and electronics from his dad. He really liked math and wanted to pursue math and science in school. Einstein would later move back to Bern, Germany and work in the patent office. Was Albert Einstein a US citizen? Albert immigrated to the United States in If he had stayed in Germany he would not have been able to hold a teaching position at the University as a Jewish person. At one point the Nazis had a bounty on his head. In Einstein became a US citizen. This theory changed much in the way scientists look at the world and set the foundation for many modern inventions, including the nuclear bomb and nuclear energy. In this formula, "c" is the speed of light and is a constant. It is assumed to be the fastest speed possible in the universe. This formula explains how energy E is related to mass m. The Theory of Relativity explained a lot of how time and distance may change due to the "relative" or different speed of the object and the observer. What other discoveries is Albert Einstein noted for? Albert Einstein laid much of the foundation for modern physics. Some other of his discoveries include: Photons - In Einstein came up with the concept that light is made up of particles called photons. This became an important discovery for many branches of science and he was awarded the Nobel Prize for Physics in Bose-Einstein Condensate - Together with another scientist, Satyendra Bose, Einstein discovered another state of matter. Sort of like liquid or gas or solid states. Today this discovery is used in cool stuff like lasers and superconductors. Albert Einstein Photo by Unknown Einstein wrote many papers which included theories and models that would help define and move forward our understanding of the world and particularly quantum physics. Some of his work included subjects from a model for a wormhole to the Einstein refrigerator. The Atomic Bomb Albert Einstein did not work directly on inventing the Atomic bomb , but his name is closely associated with the bomb. Fun Facts about Albert Einstein Albert experienced speech problems as a child. He failed his first try on his entrance exam for college this gives us all hope! He was offered the presidency of Israel. He auctioned off a hand written version of his Theory of Relativity in for 6 million dollars in order to help with the war effort. Albert had a sister named Maja. Activities Read a more detailed Albert Einstein biography. Listen to a recorded reading of this page: Your browser does not support the audio element.

Chapter 8 : What were some of Albert Einstein's inventions

Although Albert Einstein's theories laid the foundation for the creation of the atomic bomb, the only thing he really invented was a refrigerator. Invented in conjunction with his former student Leo Szilard, the Einstein refrigerator did not require anything but a heat source for operation.

However, later in life Einstein became very interested in his Judaism. Einstein did not begin speaking until after age two. According to his younger sister, Maja, "He had such difficulty with language that those around him feared he would never learn". He tried hard to understand how the needle could seem to move itself so that it always pointed north. The needle was in a closed case, so clearly nothing like wind could be pushing the needle around, and yet it moved. So in this way Einstein became interested in studying science and mathematics. His compass inspired him to explore the world of science. When he became older, he went to a school in Switzerland. After he graduated, he got a job in the patent office there. While he was working there, he wrote the papers that first made him famous as a great scientist. Einstein had two severely disabled children with his first wife Mileva. His daughter "Lieserl" her real name may never be known was born about a year before their marriage in January. He spent decades in hospitals, and died in the Zurich sanatorium in 1955. In 1902, Einstein became very sick with an illness that almost killed him. His cousin Elsa Lowenthal nursed him back to health. After this happened, Einstein divorced Mileva, and married Elsa on 2 June 1903. Just before the start of World War I, he moved back to Germany, and became director of a school there. He lived in Berlin until the Nazi government came to power. The Nazis hated people who were Jewish or who came from Jewish families. They accused Einstein of helping to create "Jewish physics," and German physicists tried to prove that his theories were wrong. Roosevelt, to say that the United States should invent an atomic bomb so that the Nazi government could not beat them to the punch. He was the only one who signed the letter. He was, however, not part of the Manhattan Project, which was the project that created the atomic bomb. Einstein, a Jew but not an Israeli citizen, was offered the presidency in 1952 but turned it down, stating "I am deeply moved by the offer from our State of Israel, and at once saddened and ashamed that I cannot accept it. It says that both distance measurements and time measurements change near the speed of light. Einstein said that Special Relativity is based on two ideas. The first is that the laws of physics are the same for all observers that are not moving in relation to each other. All the people on a jet airplane would not be moving much in relation to each other, but the people in two different jet airplanes that come toward each other would be moving toward each other very fast. The people who are all going in the same direction at the same speed are said to be in an "inertial frame. A vacuum is a volume without any matter in it. Light from both stars is measured as having the same speed. People who are in the same "frame" think of them as being in a big box so that they all go places together and at the same speed will measure how long something takes to happen in the same way. Their clocks will keep the same time. But people moving in another "frame" will look over at them and see that their clocks were moving at a different rate. The reason that this happens is actually quite simple. It is the consequence of two ideas. One idea we have seen already. No matter what you are doing, even if you are moving toward a distant star at half the speed of light, or if you are moving away from it at half the speed of light or any other speed, it does not matter, if you measure the speed of the light coming from that star it will always be the same number. The other idea goes against our ordinary ideas. The other idea says that who is standing still and who is moving is whoever you say is standing still or moving. How can that be? Imagine you were all alone in a different universe. That universe has no suns, planets, or anything else. It just has you and your spaceship. Are you standing still? Those questions do not mean anything. Because when we say we are moving we mean that we can measure our distance from something else at one time and measure the distance at another time and the numbers will not be the same. If the numbers get bigger we are moving away. If the numbers get smaller we are moving closer. Suppose a sailor is standing on the edge of a very long boat with a flat top. Her boyfriend is standing on the dock. They are still very close together, so they shout to each other. The boat starts to leave. The sailor runs toward the back of the boat at the same speed that the boat moves forward so she and her boyfriend can keep talking. As far as her boyfriend is concerned, she is not moving. So to have movement you

must have at least two things. We do not think about it because when we sit on the earth in a park, which is moving very fast around the sun, we think we are not moving because we do not get any closer or farther away from the trees in the park. Now imagine that another spaceship appears in this other universe. On your spaceship you say that their spaceship is coming closer to yours. After all, you do not feel yourself moving. On their spaceship they say that your spaceship is coming closer to theirs. They do not feel themselves to be moving either. Somebody on an airplane can be moving at several hundred kilometers per hour, but they say, "I am just sitting here. Imagine that a basketball player is on a glass airplane on the ground. People outside can see him very easily. He begins to walk from the back of the airplane toward the front of the airplane, bouncing his basketball as he goes. Maybe the distance between the places where his basketball hits the floor of the airplane is about one meter or one yard. If some people are under the airplane they can mark the place directly under the airplane where the ball hits the floor. Those marks are a meter or maybe a yard apart. So everybody agrees that the bounces are about a meter or a yard apart. Later the plane takes off. People still watch it from on the ground. But this time bounce number 5 is over a place in Gibraltar and bounce number 6 is over a place in Spain. The distance between bounces is measured in kilometers or miles on the ground, but the people on the plane get the same answers they did while the plane was on the ground. Now suppose some people are on a big spaceship and they want to make a very accurate clock. So they make a long tunnel between decks from what would be like the top of an airplane to what would be the bottom of an airplane. At one end they put a mirror, and at the other end they put a simple machine. It shoots one short burst of light toward the mirror and then waits. The light hits the mirror and bounces back. They decide that a certain number of bounces will be defined as a second, and they make the machine change the seconds counter every time it has detected that number of bounces. Every time it changes the seconds counter it also flashes a light out through a porthole under the machine. So somebody out taking a space walk will see the light flashing every second. We know the speed of light, and we can easily measure the distance between the machine and the mirror and multiple that to give the distance the light travels. So we have both d and r , and we can easily calculate t . The people on the spaceship compare their new "light clock" with their various wrist watches and other clocks, and they are satisfied that they can measure time well using their new light clock. Now this spaceship happens to be going very fast. It is not coming to Earth to visit, but it does happen to fly over the North Pole. There is a science station with a telescope at the North Pole. They see a flash from the clock on the space ship, and then they see another flash. Only the flashes do not come a second apart. They come at a slower rate. The reason is that the situation is like the basketball player on the airplane. The ball hits the floor and bounces. That is like the light hitting the mirror and being reflected. That is like the light hitting the machine and triggering a new burst of light. Depending on how fast the plane is going, it might be a kilometer or even a mile away. So the man on the North Pole sees the light flash on the side of the spaceship when it is thousands of miles away, and then sees the next flash when the spaceship has gotten thousands of miles closer. That is why the clock on the spaceship is not flashing once a second for the Earth observer. It is a famous equation in physics and math that shows what happens when mass changes to energy or energy changes to mass. The "E" in the equation stands for energy.

Chapter 9 : Albert Einstein - HISTORY

Albert Einstein had many discoveries as a scientist, but is most known for his Theory of Relativity. This theory changed much in the way scientists look at the world and set the foundation for many modern inventions, including the nuclear bomb and nuclear energy.