

Leonardo da Vinci

Leonardo da Vinci was born in 1452, in the town of Vinci, which was in the former Republic of Florence, now modern Italy. Da Vinci lived in Vinci until he was sixteen years old. At that time, his father enrolled him as an apprentice to Andrea Del Verrocchio. Verrocchio was a very popular artist in Florence. Da Vinci was able to work under Verrocchio until he was twenty five. He was accepted in the painters' guild of Florence at the age of twenty; however, he decided to stay with Verrocchio. While he worked with Verrocchio he was able to practice painting and sculpting (Horse). Over the nine years he worked with Verrocchio, da Vinci developed interests in several different sciences.

After he completed his apprentice with Verrocchio, da Vinci worked for himself for another five years, until he had the opportunity to work under the Duke of Milan. Before the thirty years he worked for the Duke of Milan, da Vinci was well educated in architecture, engineering, and military services. The Duke hired him as “painter and engineer of the Duke”. It was these seventeen years the true da Vinci came out because he was able to put his knowledge of sciences to use. As well as creating paintings and sculptures, da Vinci was also able to work on hydraulic and mechanical designs for the duke (University).

In 1499, French armies invaded Milan, and the duke was overthrown. After the duke was overthrown, da Vinci spent a few years learning about different sciences. In 1503 he was hired as the senior military architect and general engineer to Cesare Borgia. Ten years later da Vinci was invited to serve under King Frances I as first painter, architect, and mechanic of the king (University).

Over his lifetime, da Vinci was a masterful artist; nowadays he is considered one of the greatest of all time. His paintings are recognizable by all ages of people. His most famous painting, the Mona Lisa, is probably the world's most well-known painting of all time. Some other famous paintings include "The Last Supper", the "Virgin of the Rocks", and the "Virgin and Child with St. Anne." Da Vinci drew about many different ideas — some of his paintings were designs of different types of weaponry. He would often design different types of cannons, shields, crossbows, and assault weapons (Arc Space). Several of da Vinci's paintings revolved around the sciences. He would often create paintings with different types of gears and levers in them. He also created several paintings involving the tremendous force behind water. Toward the end of his life, da Vinci began creating paintings that showed tremendous waves crushing men and nature. At the time people thought that these paintings were thought of as poetic imagination (Arc Space). However, today we see that da Vinci was attempting to show the scientific fact of the true power that water has.

As well as being well-known as an artist and engineer, da Vinci was also very interested and educated in optics, anatomy, botany, geology, and aerodynamics. Aerodynamics was an interest of da Vinci as a young child. It is said he had a dream that a hawk swooped down and struck his mouth (America). To most children, this would be followed by a period of crying and screaming for their parents. However, da Vinci was amazed by the fact that birds could fly. Along with being interested in human anatomy, he was also amazed with a bird's anatomy. Da Vinci developed an ornithopter — a machine that simulated a bird flapping its wings. Using a system of pulleys, gears, and cranks, he was able to devise such a machine. However, this machine never took off; it

was found centuries later that humans were just too heavy to fly. At this time, many of Leonardo da Vinci's ideas were just that, ideas. However, it was not found until centuries later how far advanced da Vinci was in aeronautics. After he passed away, many of da Vinci's journals containing much of his ideas on flight were lost. It was not until these journals were found that proper recognition was given to him (America). Today da Vinci is recognized as one of the first and greatest pioneers in flight.

Besides painting massive waves, Leonardo da Vinci was also fascinated by the engineering aspect of water. In a time long before electricity was invented, water was one of the few power sources. This was one of the driving forces behind da Vinci's fascination of water. He designed many devices that many take for granted today. Da Vinci had plans for snow-type shoes that would be used to walk on water and he designed an underwater breathing apparatus. Today's snorkel greatly resembles his designs for an underwater breathing apparatus. Da Vinci designed webbed gloves used to explore underwater. These gloves, combined with his underwater breathing apparatus make up the majority of a scuba diving suit. He also had designs of a floatation device, which was a predecessor of today's life preservers (Leonardo).

Da Vinci had designs for devices that would be able to sink ships underwater. One of his truly great designs was for a double hulled ship, which in his times would have been a driving force in battle. This would give a country an immediate edge in battles at sea. Da Vinci also had designs for machines to dredge and clean harbors and channels (Leonardo).

In the 1500's bridges had yet to be built, let alone be designed. Da Vinci had preliminary designs to build a bridge that would start at the Golden Horn and span across

the Gulf of Istanbul, connecting to the Bosphorus. This idea was quickly rejected by other engineers of the time. The thought of building such a large structure was absolutely unheard of. However, modern engineers have analyzed these preliminary designs and have determined that the bridge da Vinci had designed would have been structurally safe (Leonardo). It's truly hard to imagine a bridge of this size being built in the 1500's.

In 1503 da Vinci was beginning designs on a project to divert a river. The idea was to divert the Arno River around Pisa; this would then allow the Florentines to seize the city of Pisa, where they were engaged in battle. After the river was to be diverted, da Vinci designed plans to construct canals to allow easy access to the sea. As was most of da Vinci's designs, the river was not diverted and the canal was never built.

For a normal person, creating paintings and sculptures, designing ways to fly, and designing the world's earliest bridge would be considered a successful career. However, da Vinci didn't stop there; his largest engineering brainstorm was "the Ideal Town." His main goal for this "Ideal Town" was to improve the quality of life in the 1500s. At this time streets were very windy and sewer systems were open-air, which caused rats and parasites to be open to people traveling near them (Museum).

To tackle such a large task was going to be very time consuming. Da Vinci proposed to remodel the town. This consisted of renovating the streets to make them straighter and constructing canals in as many places as possible. Having these canals would provide easy access to traders and merchants in and out of the city. It would also make it easy for residents to flee their homes if the city fell under heavy attack from other countries. Combined with canals, sluice-gates and locks would control water flow into the town. Also, an underground system of pipes would allow sewage to flow so that it is

not exposed to open air (museum). Although this idea was never put into place, it's truly amazing to see that da Vinci had ideas five hundred years ago that are commonly used today in residential housing design.

Looking back on the life of da Vinci, it's easy to say that he was years ahead of his time. He was one of the first and most significant engineers of all time. When one analyzes all that he has done, one may ask themselves a lot of "ifs." What would the world be like now if da Vinci had never become interested in gears and pulleys? One can also ask themselves what the world would be like if there were other engineers and scientists around in his time that agreed with his ideas and decided to construct them. If his bridge idea would have been constructed, and a body of water could be crossed in the 1500s, could an ocean be crossed today? If he had constructed a double hulled ship in the 1500s, what kind of ships would have been around in the 1700s around the time of the revolutionary war? Would the United States have been able to defeat Britain if Britain had access to more advanced ships? If da Vinci had designed a machine capable of sinking ships underwater, it's almost scary to think about what kinds of other advances there could have been in the 1700s during the revolutionary war. Overall da Vinci was a genius, it's hard to even imagine what the world would be like today without him; however, it's even harder to imagine if others had believed in his ideas and helped him to implement his ideas.

Works Cited

America's Air Force. "Leonardo da Vinci." 2 April. 2005.

<<http://www.af.mil/history/essay3.asp>>.

Arc Space. 17 March. 2003. "Leonardo da Vinci." 2 April. 2005.

<http://www.arcspace.com/exhibitions/da_vinci_ex/>.

Horse in Art. 2001. "Leonardo da Vinci." 2 April. 2005.

<http://horse-in-art.com/b_le.htm>.

Leonardo da Vinci Museum. 1997. "Inventor." 2 April 2005.

<<http://www.mos.org/leonardo/inventor.html>>.

Museum of Science. "Leonardo da Vinci's The Ideal Town." 2 April 2005.

<<http://www.museoscienza.org/english/leonardo/idealtown/idealtown.htm>>.

University of St. Andrews, Scotland website. Dec. 1996. Leonardo da Vinci. 2 April.

2005. <<http://turnbull.dcs.st-and.ac.uk/history/Mathematicians/Leonardo.html>>.