

The Legacy of da Vinci

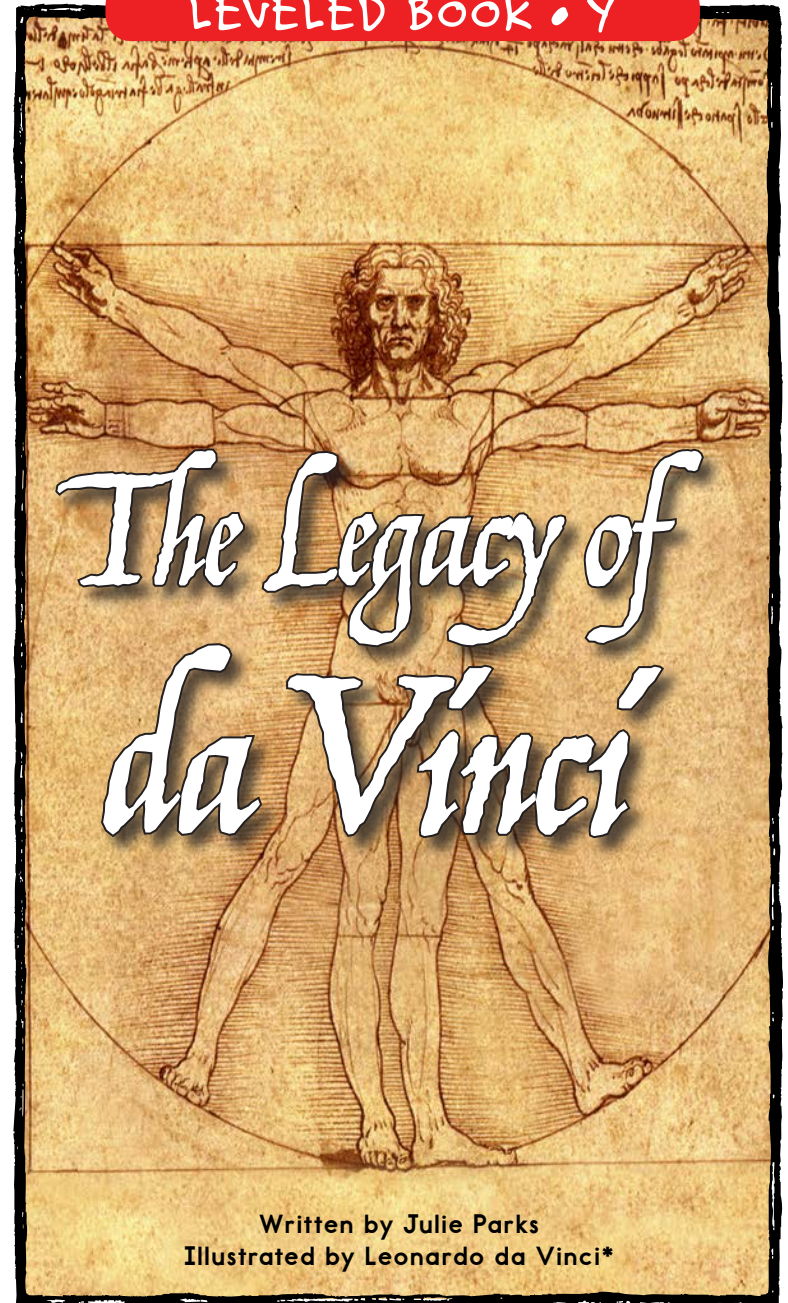
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Word Count: 2,195



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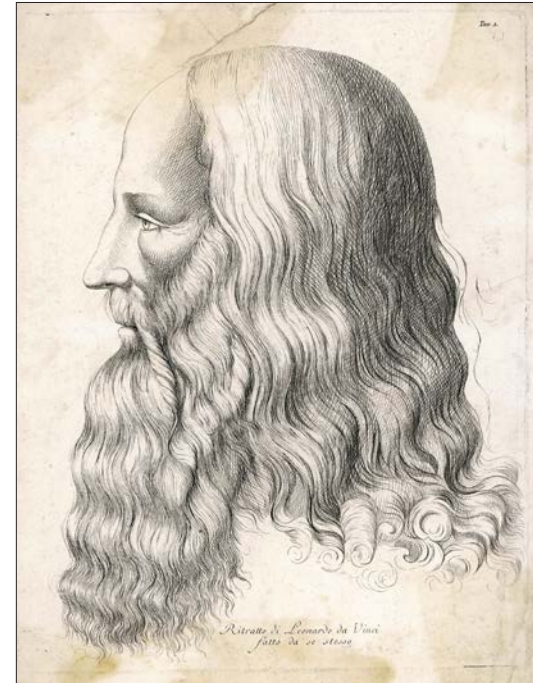
Written by Julie Parks
Illustrated by Leonardo da Vinci*

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Glossary

- anatomical** (*adj.*) having to do with the structure of a body (p. 23)
- apprentice** (*n.*) a beginner learning a skill or trade from a master (p. 7)
- camera obscura** (*n.*) a darkened closed space in which images from the outside are projected through a small lens onto a facing surface (p. 17)
- commissions** (*n.*) tasks or projects that someone requested and paid for (p. 8)
- guild** (*n.*) an association of people of the same trade; a union (p. 18)
- hydraulic** (*adj.*) operated by water (p. 16)
- Industrial Revolution** (*n.*) a shift in manufacturing from home-based hand production to large-scale factory production (p. 21)
- innovative** (*adj.*) new and original (p. 21)
- novelty** (*n.*) something new and unusual (p. 17)
- prototypes** (*n.*) original forms used as the models for later production (p. 15)
- Renaissance** (*n.*) a historical period characterized by the revival of classical art, literature, and architecture (p. 7)
- replica** (*n.*) a copy or reproduction of a work of art, often on a smaller scale (p. 16)

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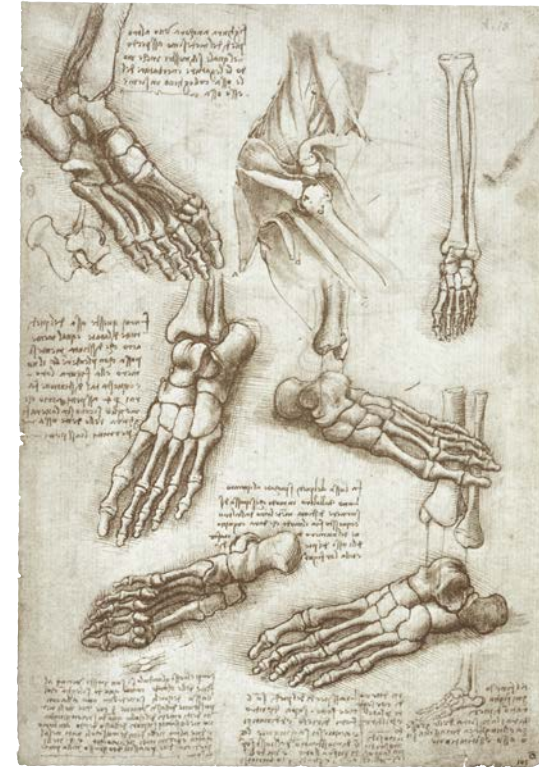
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* All illustrations in this book are taken from Leonardo da Vinci's notebooks except for the illustration on page 17 (© Learning A-Z).



Although his biographies contradict one another, the fascination of Leonardo's life and discoveries continues even today. He created over 1,500 detailed drawings of the human body, which was a great achievement. His enormous contribution to scientific studies in the area of **anatomical** illustrations alone is priceless.

He lived his life in pursuit of knowledge and took on the responsibility of solving problems on his own. He certainly modeled his life after one of his quotes, "Knowledge of all things is possible."

The Legacy of da Vinci
Level Y Leveled Book
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Written by Julie Parks
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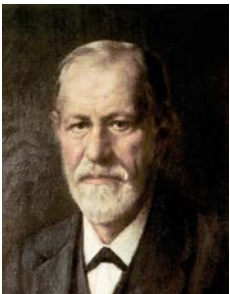
Oscar Wilde



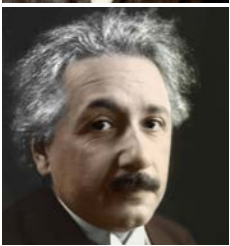
William Butler Yeats



Sigmund Freud



Albert Einstein



Andy Warhol



Many areas of study could have been advanced by Leonardo's ideas centuries ago, if only half of his 13,000 pages of research and drawings hadn't been lost.

Leonardo da Vinci's art and notebooks have been studied or written about by such famous people as the playwright Oscar Wilde, the poet William Butler Yeats, the psychologist Sigmund Freud, the scientist Albert Einstein, and the artist Andy Warhol.

One of his biographers wrote that Leonardo has always been "more studied than understood," since he didn't write much in his journals about his personal life and feelings. Leonardo also didn't date most of his works and notebooks, so there is much confusion about when things occurred in his life and why.



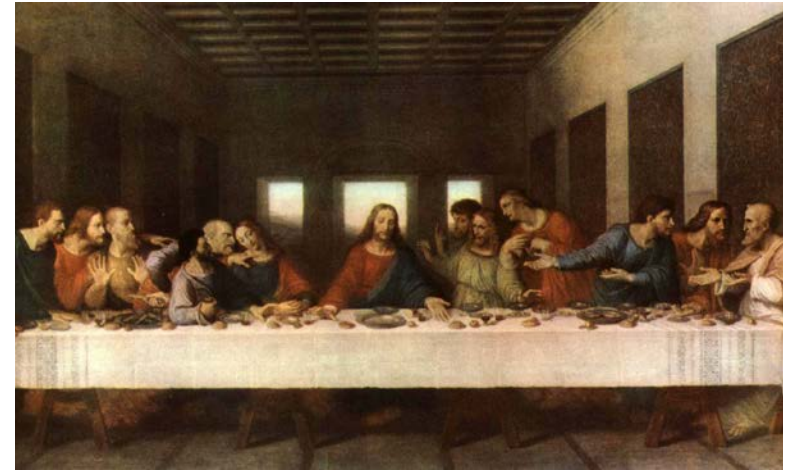
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A Class Clown Without a Class

Leonardo, born in 1452 in the small Italian village of Vinci, was a prankster. Leonardo's curiosity would often lead him on adventures, even as a young child. One time, he made bizarre creatures out of soft wax, filled them with air, and released them into a garden full of surprised and frightened people. Another time, Leonardo painted a monster on a wooden shield and put it in a darkened room to scare his father. When his father walked in and light from the window shone only on the monster, he thought the monster was real so he ran away.



For many years, most people knew Leonardo da Vinci only as an artist since he had created such masterpieces as *The Last Supper* and *La Gioconda*, better known to Americans as *The Mona Lisa*. They had no reason to think of him as anything other than a wonderful painter, especially since his only published book was on the subject of art.

It wasn't until the **Industrial Revolution** in the 1880s that Leonardo's documents began to resurface, and people learned of his **innovative** ideas. By then, many of his creations had been reinvented and the credit given to others.



Lost Notebooks

One of his dedicated students, Count Giovanni Francesco Melzi, inherited Leonardo's notebooks and documents along with many of his other belongings. Melzi tried to compile and organize



A page from *A Treatise on Painting*

the thousands of documents into the books his master dreamed of, but he was only able to put together one book. That book, called *A Treatise on Painting*, focused on Leonardo's thoughts and beliefs about art and the artist. The book was published many years after Leonardo died.

When Francesco Melzi passed away, Leonardo's notebooks and documents passed on to Melzi's son, who didn't care about them at all. Leonardo's work was stored away in the younger Melzi's attic for years. Eventually, he gave away or sold much of it to various collectors and it was scattered across the world.



This is one of da Vinci's self-portraits. He lived to be 67 years old.

Leonardo was very different from other children his age. He had charm. He was gentle, handsome, and loved animals. In fact, he loved animals so much that he refused to eat meat. Vegetarians were very rare during that time, and people thought it strange that Leonardo refused to eat meat. Leonardo was different in other ways, too. He understood math concepts well beyond his years. His talents as a musician and as an artist, even as a young child, had adult qualities.



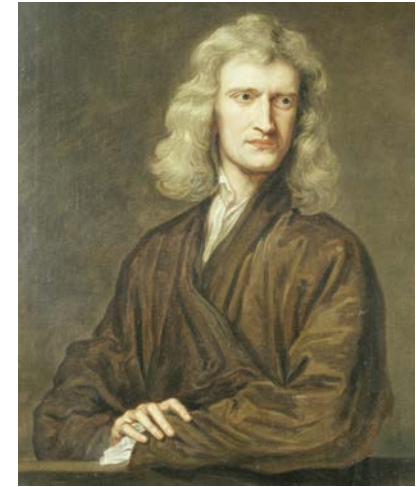
Growing Up

As a child, Leonardo lived with his grandparents and uncle. His father, Ser Piero, was an ambitious businessman and spent most of his time 40 miles away in the city of Florence, Italy. Leonardo's father made rare and short trips to the family's home near Vinci, Italy.

Since his father wasn't around much, Leonardo spent much of his time with his father's brother, Francesco. His uncle allowed him to explore the fields and woods near his farm. Uncle Francesco was patient and always tried to answer Leonardo's questions. He taught him the names and uses of plants and herbs, the signs of approaching weather, and the habits of local wildlife. The village priest taught Leonardo reading, writing, and basic math. All these experiences gave Leonardo a thirst for more knowledge.



Although Leonardo kept some ideas to himself, such as his designs for a submarine that he feared might be used to kill innocent people, he did share much of his knowledge with others.



Isaac Newton

For many years, one of Leonardo's theories, "nothing is moved, unless it is moved upon," was known as Leonardo's law. However, when Sir Isaac Newton worked out a mathematical formula for the principle during the seventeenth

century, the law became known as Newton's first law of motion.



Leonardo intended to publish his writings in the form of an encyclopedia, but he kept himself so busy he never got it published. He died on May 2, 1519 at age 67.



Knowing How to See

When Leonardo became a master craftsman, he registered with the **guild** and began training his own apprentices. Leonardo's students often completed his unfinished paintings. This was a good arrangement for Leonardo, who preferred creating and improving gadgets, or studying the things he felt passionate about rather than painting portraits of people all the time.

When he wasn't painting or inventing, Leonardo was observing or watching. He watched birds, water, people, and anything else that interested him. He believed that knowledge

is gained from "knowing how to see." His thoughts and ideas were not always correct, but his extensive observation of how the world worked allowed for creations and discoveries that were astoundingly accurate for his time.

Leonardo also sketched the animals in his imagination.



The markets on Ponte Vecchio Bridge and a view from the Duomo in Florence

When Leonardo was a teenager, he moved to Florence to be near his father, who was newly married. Florence played a major role in Europe's rebirth, called the **Renaissance**, which took place in the sixteenth century (1485–1603). Artisans, sculptors, poets, and musicians lived and worked throughout the city.

Leonardo wanted to be an artist, so his father agreed to let him work as an **apprentice**, or assistant, to a local artist.





At the workshop of the master artist, Andrea del Verrocchio, Leonardo learned many techniques for painting and sculpting—he even learned to make his own paints using pigments and egg whites. Soon, Leonardo worked his way up to head assistant, and not long after, his painting skills surpassed Andrea's, making Leonardo a well-respected artist.



Leonardo liked painting, and he received many **commissions**, or requests, from the people of Florence who wanted him to paint their portraits.



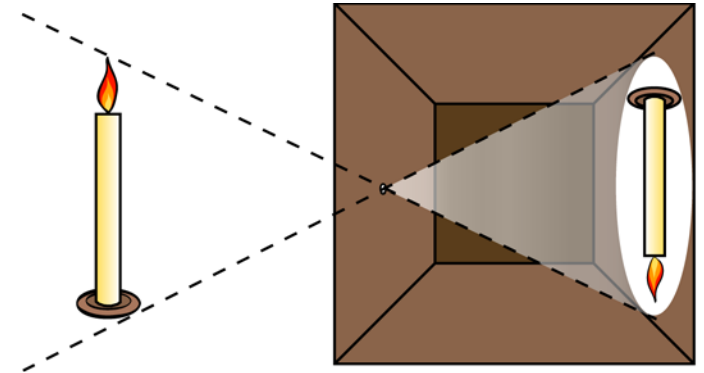
However, some people complained that Leonardo didn't take the work seriously.

They said he couldn't focus on

one task long enough to complete the job. Many of the customers became upset waiting for their paintings. Leonardo did not care. He was busy thinking up new projects.



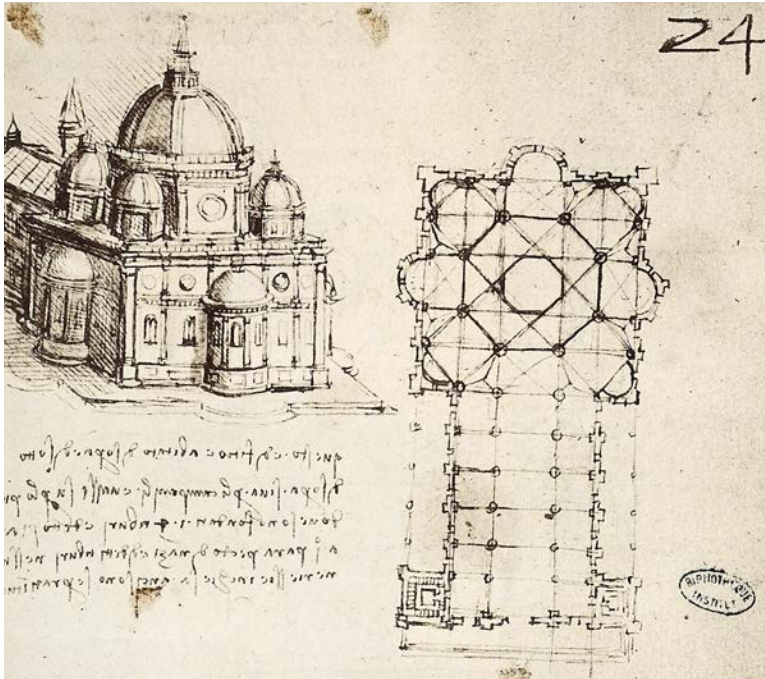
Many of Leonardo's inventions were unlike anything that people living in the 1400s could even imagine. In modern times, it's commonplace to have doors open for you automatically, but if you lived in the fifteenth century, a door that was suddenly pulled open with ropes and weights, as in one of Leonardo's designs, was a **novelty**. It might have even seemed a little scary.



Leonardo's ability to project images of an object onto a wall by using a box, a small lens, and a candle also amazed people. His **camera obscura** was a creation that allowed images to be captured on paper.

For these types of amazing feats, Leonardo was accused of witchcraft by some of his own students. His ideas were so unfamiliar that his work became controversial. It was probably because of this that the pope in Rome refused to commission work from Leonardo.





One of da Vinci's cathedral designs

If you were to tour a museum that featured Leonardo's work, you might find a prototype of his clock, a miniature **replica** of his design for a cathedral, a small model of his helicopter, or representations of the many **hydraulic**, or water-powered, machines that he sketched carefully and faithfully into his notebooks. In 1993, and subsequently, groups of scholars have gotten together and tested Leonardo's hang glider designs.

The prototypes have worked beautifully, especially when modern lightweight materials were used.



Multitalented

Leonardo wasn't just an artist, he was a talented problem-solver. He learned from his Uncle Francesco that one should ask questions and seek answers; and if a problem should arise, one should look for a solution. Leonardo followed this advice and began solving some of the problems he found while painting.

For example, doing his work by the dim light of his candles and oil lamps proved difficult. So, Leonardo created a new lamp that used water to magnify the flame, making light glow across the entire room. Straining his eyes to paint precise details took a toll on his eyesight. So he improved his eyeglasses to make his vision better.



Da Vinci's sketch of his oil lamp



Leonardo invented many other things to help him solve some of his problems. He created pliers and a wrench to help tighten and loosen the parts of some of his larger projects—neither of these tools had ever been seen before his time. He designed a new clock that would tell minutes as well as hours to keep him on time. Always a prankster, Leonardo also developed a very funny alarm clock. Here's how it worked:

Someone would tie a rope to a sleeping person's ankles, and then, on the other end, suspend a bucket from the ceiling, which would gradually fill with water overnight. When the bucket was full, the weight of it would pull the person's legs straight up into the air. This certainly

succeeded in waking the person up!

Often the things Leonardo created were written, described, and sketched in notebooks. These notebooks are windows into how Leonardo thought and problem-solved.

A replica of da Vinci's alarm clock



Whenever Leonardo studied something, it inevitably led to more questions and more interests. For example, when he focused on the study of light and how it helps a person see, it led him to study the human eye, and then the human body.

The study of birds led him to the study of flight, mathematics led to mechanics, and his interest in air and water currents led him to study power and energy.

The more he learned, the more he wanted to know. “Why” or “how” were some of his favorite questions to ask when he finished reading because it got him thinking and pursuing new interests.

His notebooks are studied today. Several **prototypes**, or models, have been built in modern times using the notes in his notebooks. Many of the prototypes actually work!

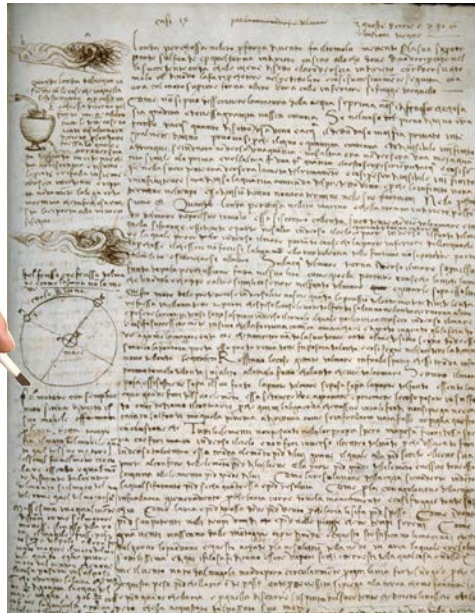
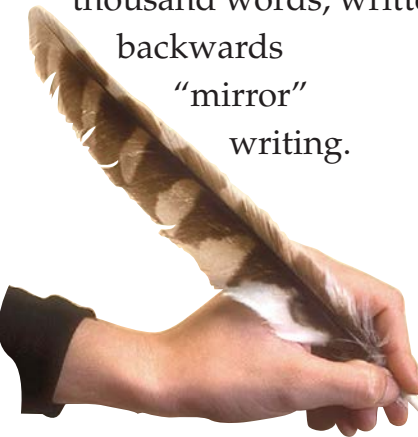


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Learning was a never-ending passion for Leonardo. He read and studied every book he could. He borrowed books and spent hours in libraries.

While he read, Leonardo wrote down any words he didn't know, so he could learn them later. One of his notebooks contained over nine thousand words, written in his unique backwards

“mirror” writing.



Some experts think that he may have written backward to keep his ink from smearing, because he was left-handed. Since he didn't have a teacher to force him to write with his other hand, the way some left-handed people did, Leonardo simply wrote in the way that was most comfortable for him.

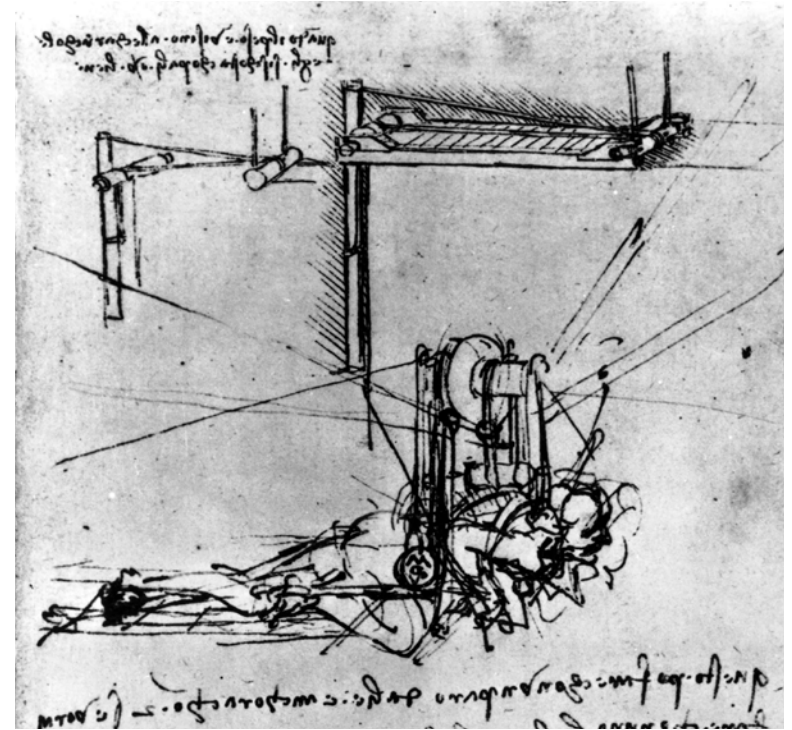


Leonardo was a great problem-solver. What enabled him to be so great was his own curiosity. He never lost his childhood desire to explore, just as he had done in the fields and woods near his uncle's farm. He loved studying things. One time he wanted to know how old a tree was. He studied it and figured out that by counting the rings on a tree's trunk anyone could determine its age. Another time, he wanted to know if he could create solar power, and so, using concave mirrors to reflect the sunlight, he heated water.



Leonardo also had a lifelong curiosity with the concept of flight. One of his favorite subjects to study and sketch in his notebooks was the bird. Leonardo thought that if he could understand how a bird flew, he would be able to use that knowledge to create a machine that would allow a person to fly.

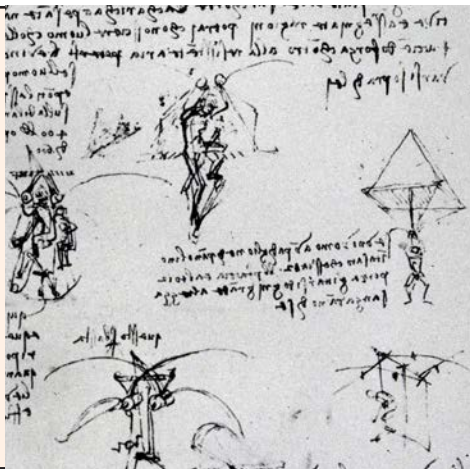
This idea led to sketches and designs for an early helicopter that were based on a child's toy, a bird-like machine that would have been much too heavy to fly. He also sketched a parachute and his most successful flight design, a hang glider, in his books!



An early sketch of da Vinci's hang glider

Do You Know?

It is thought that Leonardo may have actually tested one of his flying machines on January 2, 1496, four hundred years before the Wright brothers' first flight.



Leonardo didn't build all of his inventions, but he carefully sketched his ideas into his notebooks and wrote very precise details and instructions for each one.

Leonardo believed drawing was the most complete way to understand something. Therefore, he drew the objects he studied from many different angles to show their forms and functions. Many of his sketches were so detailed and beautiful that they are used as examples in books today.

