

**KIDS
DISCOVER**

da Vinci

Leonardo

FLIGHT
15TH-
CENTURY
STYLE



I'M THE
RENAISSANCE
MAN!

THE MAN
WHO
COULDN'T
WRITE
RIGHT

LEARN
COOL PAINTING
TECHNIQUES

THE MOST
TALKED-ABOUT
PAINTING
IN THE WORLD

Portrait of the Artist

Artist, engineer, scientist, inventor, musician—Leonardo da Vinci did it all—and did it well. As a painter, he created the *Mona Lisa*, the most famous work of art in the world today. As an inventor, he made sketches of tanks, planes, submarines, and helicopters—machines that were not actually produced until hundreds of years after his death. Called one of the greatest thinkers and creators of all time, Leonardo is regarded as highly skilled in architecture, sculpture, biology, botany, anatomy, geology, optics, and city planning. Those who knew him said he sang beautifully and was a fine musician. And that's not all. Contemporaries described him as kind, generous, and charming.

Leonardo da Vinci was born on April 15, 1452, in or near the town of Vinci, in central Italy. ("da Vinci" means "from Vinci.") Little is known of his early life, except that he was brought up by his father's elderly parents and that he probably had only an elementary education.

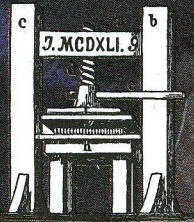
So, how did this son of a peasant woman and a notary (a law clerk) grow from a curious child to a man of startling brilliance and one of the world's most talented artists?

Read on.

● Renaissance Highlights

LEONARDO lived in Italy during the time in history known as the Renaissance, which extended from roughly 1400 to 1600 in Europe. (The word *renaissance* means "rebirth" in French.) During the Renaissance, people admired the ancient Greek and Roman civilizations and tried to improve upon

the achievements of those times. Great advances were made by writers, thinkers, and scientists, who looked at the world with a new set of ideas and attitudes. A "human-centered" way of thinking challenged the teachings of the Catholic Church. (Catholicism was the dominant religion in Europe.)



c 1440

JOHANN GUTENBERG (c 1400–1468) is credited with inventing movable type for printing, making books more widely available.



c 1495

DESIDERIUS ERASMUS (1469–1536), a Dutch priest, shocks the world by declaring humans more important than the Church. His goal: to reform the Catholic Church.



c 1535

MARTIN LUTHER (1483–1546), a German priest in the Roman Catholic faith, strongly attacks the Church in an attempt to reform it. He is the founder of Protestantism.

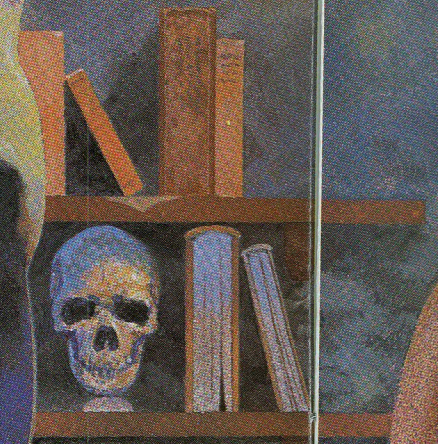
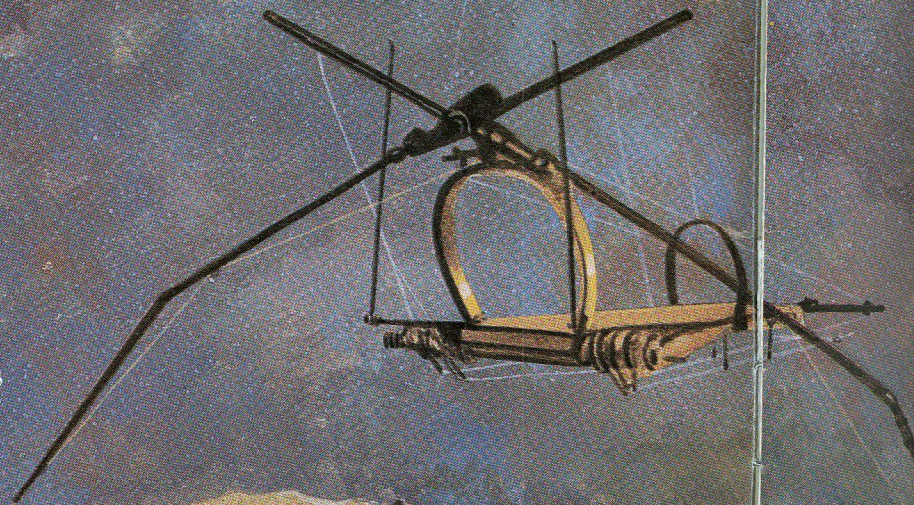


1543

NICOLAUS COPERNICUS (1473–1543) publishes the theory that the planets revolve around the sun.



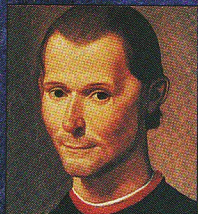
CHRISTOPHER COLUMBUS (c 1451–1506) discovers the Americas.



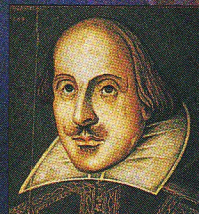
← **DURING HIS LIFE-** time, Leonardo worked in several studios on the many, varied creations that have made him one of the most admired and respected people in the history of the world. This illustration shows how his studio in Milan may have looked.



1492
CHRISTOPHER COLUMBUS (c 1451–1506) lands in the Bahamas.



1513–1514
NICCOLO MACHIAVELLI (1469–1527) writes *The Prince*, which examines Renaissance political practices and offers advice on how best to govern.



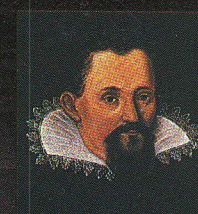
1564
WILLIAM SHAKESPEARE (1564–1616), English dramatist and poet, is born. Among his many famous plays are *Romeo and Juliet* and *Macbeth*.



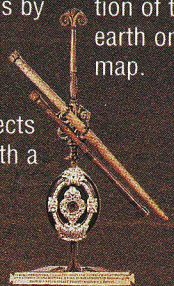
1630
GALILEO GALILEI (1564–1642) furthers the work of Copernicus by being one of the first people to examine objects in the sky with a telescope.



1569
GERARDUS MERCATOR (1512–1594) designs a projection of the round earth onto a flat map.



1609
JOHANNES KEPLER (1571–1630), a German astronomer, discovers the elliptical orbits (squashed, or elongated, paths) of the planets.



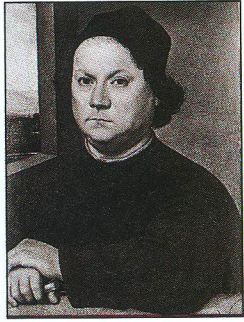
The Apprentice

As a young boy, Leonardo seems to have had a great natural talent for painting. One time—so the story goes—he painted such a realistic-looking dragon that his father, Ser Piero, was truly frightened

upon seeing it. Aware that Florence was the most dynamic and prosperous city in Italy, Ser Piero took his 14-year-old son there to become apprenticed to one of the leading artists of the day, Andrea del Verrocchio

Apprenticeship was common at this time. In the apprenticeship system, a young person worked alongside an expert for about 13 years to learn a trade.

As an artist's apprentice, Leonardo had a lot to do each day. He ground pigments, made brushes, drew, painted, and sculpted. During his apprenticeship, Leonardo worked hard and was singled out as one of the best.



ANDREA DEL VERROCCHIO, Leonardo's teacher

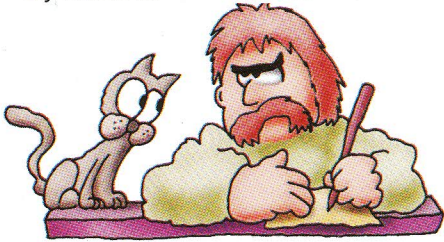
in mirror handwriting

For this reason, I judge painting to be superior to poetry. For the reason, I judge painting to be superior to poetry. For the reason, I judge painting to be superior to poetry. For the reason, I judge painting to be superior to poetry.

▲ **AT AGE 30,** Leonardo began sketching and writing daily in notebooks. His thousands of pages, published in the 1880s, attest to his unique and far-ranging brilliance. One of the most startling aspects of the work is that all his notes are written in mirror

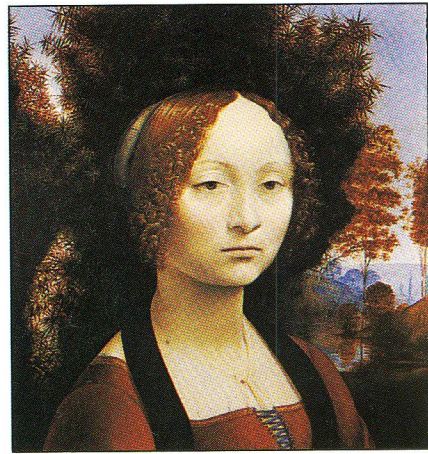
writing. (If you put it up to a mirror, you can read it—but only if you know Italian!) Although some scholars say Leonardo

practiced mirror writing in an attempt to keep his thoughts private, others believe that for left-handers, writing from right to left is more natural and clearer because there aren't any ink smudges caused by a lefty's hand trailing over recently written words.



▲ **THIS LANDSCAPE** of Tuscany, the area in Italy where Leonardo was born, is among his earliest known drawings.

► **IN VERROCCHIO'S** workshop, Leonardo and the other apprentices often worked together to complete a painting in the style of the master. However, scholars believe that the portrait of *Ginevra de' Benci* was painted by Leonardo alone. The work is admired for its careful attention to detail (notice the tiny curls); the delicate alternation of light and dark (notice how the person and the background landscape blend at their darkest points); the blue distance; and the way the portrait reveals not only what Ginevra de' Benci looked like, but also the kind of person she was. Ginevra was



a poet. She was celebrated as a great beauty as well as an independent person who turned down the chance to marry a Venetian ambassador.

in mirror handwriting

For this reason, I judge painting to be superior to poetry. For the reason, I judge painting to be superior to poetry. For the reason, I judge painting to be superior to poetry. For the reason, I judge painting to be superior to poetry.

THINK PIECE!

Which angel do you think is more interesting? Why?



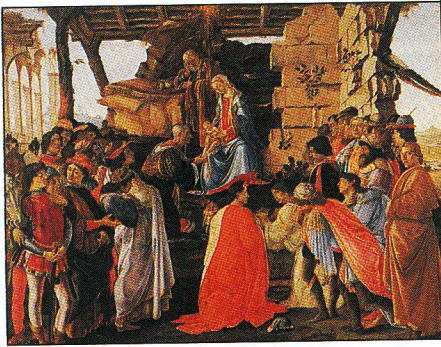


▲ **PAINTED BETWEEN** 1481 and 1482, the *Adoration of the Magi* was unfinished, probably because Leonardo left Florence to live in Milan. Although this subject—the New Testament scene in which the three kings offer gifts to the baby Jesus—had been painted many times before, Leonardo's version has been called "one of the most extraordinary pictures of the century."

There are several unique features of the painting: the Virgin Mary, in the center, is completely unbothered by the strange

◀ **MOST SCHOLARS** believe that Leonardo painted the angel on the left in Andrea del Verrocchio's *The Baptism of Christ*. Leonardo's angel has a sensitive face and soft, flowing hair. The angel on the right is more sharply focused, with clearly outlined features, in keeping with the popular style of the day.

things around her; there are two sets of stairs going nowhere; and the only colors are shades of brown, attesting to the



► **DURING THE** Renaissance, many paintings had religious themes because the Catholic Church paid artists to adorn their churches. Wealthy rulers and businesspeople also paid for works of art. Some wanted portraits of themselves and family members, while others paid artists

fact that the painting was unfinished. (Leonardo painted in one color first, then added other colors to the work.)

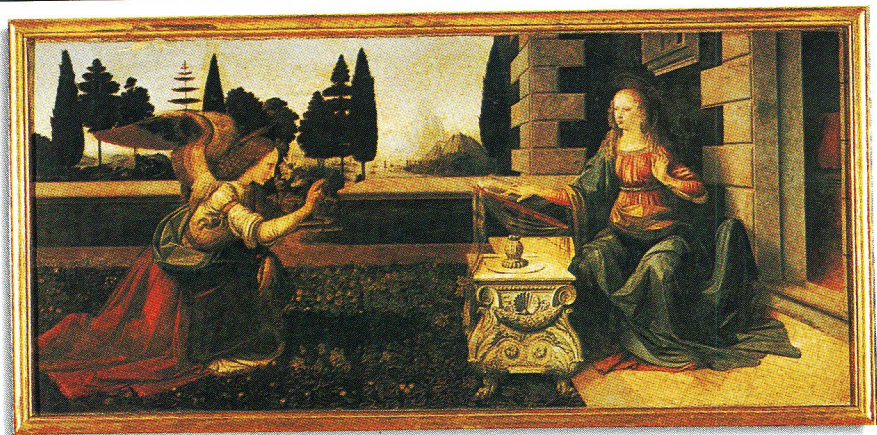
for a scene from mythology. The Medici family of Florence were perhaps the most famous of all the patrons (people who ordered and paid for art). Adorning the walls of the

THINK PIECE!

Look at a different *Adoration of the Magi* painted by Botticelli, at left. Unlike Leonardo's version, the figures here are painted in bright colors, they are all outlined, and everything looks orderly and comprehensible. Compare this to Leonardo's painting. Which do you like better?

▲ **LEONARDO PAINTED** *The Annunciation* around 1474, when he was in his early 20s. In it, the angel Gabriel tells Mary that she will "bring forth . . . the Son of God." Leonardo used a new combination: oil and tempera (powdered color mixed with egg

yolk or thin glue). The painting shows some of the qualities for which he later became famous: the capturing of the effects of light; the careful attention to detail; the use of perspective (the showing of distance by gradually decreasing the size of objects and softening their color); and the accurate representation of objects (notice the flowers).



Chapel of the Magi in the Medici Palace is a fresco by Benozzo Gozzoli, which includes a representation of Lorenzo de' Medici (right).



in mirror handwriting

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The Artist

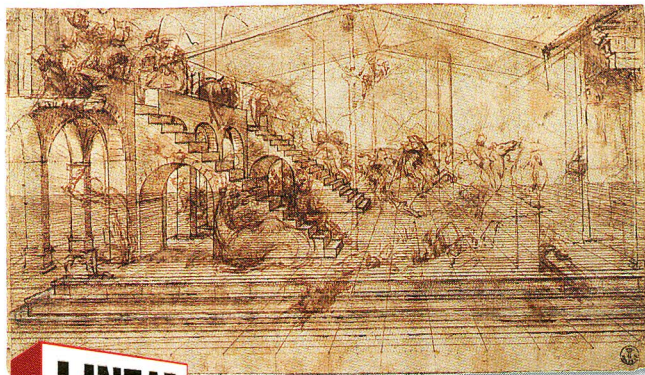
Leonardo is thought of as one of the finest artists the world has ever produced. "A genius." "Unmatched." "Divinely inspired." Naturally, such a great painter must have been highly disciplined, working diligently to complete each of his major works. Well, not exactly.

Leonardo didn't complete *most* of his major works! Some scholars suggest this was because he was a perfectionist who was never satisfied with what he did. Others say his interests changed so often that he'd quickly abandon one project in favor of a new one. Others believe that his attention span was relatively short, so he'd lose interest in long-term projects.

Whatever the reason, Leonardo completed only a handful of paintings, but they are enough to establish him as a brilliant artist.



▲ **LEONARDO LEFT** Florence and moved to Milan in 1482, at age 30. There, in service to the duke, Ludovico Sforza (above), he experimented with various techniques, while developing his theories about painting.



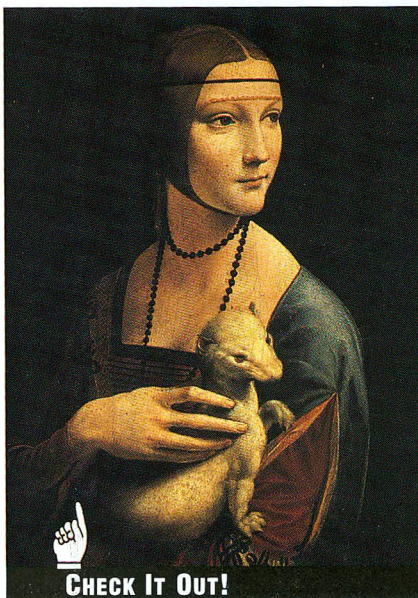
LINEAR PERSPECTIVE

▲ **LINEAR PERSPECTIVE** is a technique in which objects in the background are painted smaller, and the edges of shapes such as roads and buildings meet at a certain point called the vanishing point. Also, the artist works from a single viewpoint, so that all the elements of the painting appear as if they are being looked at from one specific spot.



AERIAL PERSPECTIVE

▲ **AERIAL, OR atmospheric,** perspective is a technique in which artists paint the background paler, bluer, and blurrier, to make it seem far away.



CHECK IT OUT!

Leonardo painted Cecilia Gallerani, a close friend of Ludovico Sforza, holding an ermine. Why do you think Leonardo placed the woman against a dark background?

(answer on back cover)

CHECK IT OUT!

Leonardo

CHIAROSCURO

► **CHIAROSCURO**, which means "light-dark" in Italian, is a technique in which there is a sharp contrast between light and shadow to create the illusion of depth and to make figures look more rounded and three-dimensional.

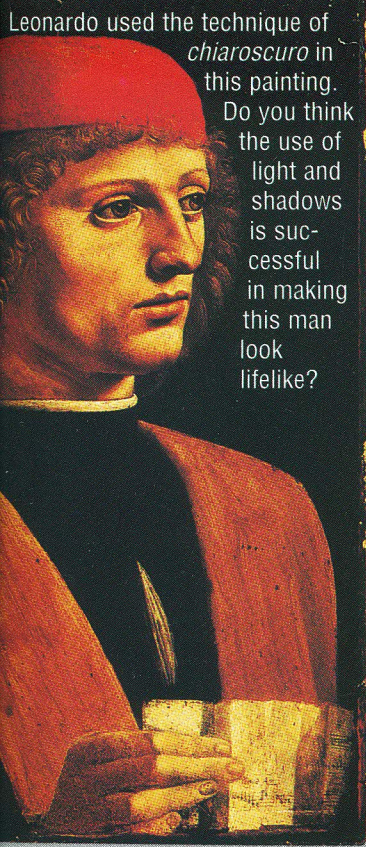
CHECK IT OUT!

What is the central focus, or vanishing point, that establishes this perspective?

(answer on back cover)

in mirror handwriting

Handwritten text in mirror handwriting, likely a quote or note related to the article.



SFUMATO

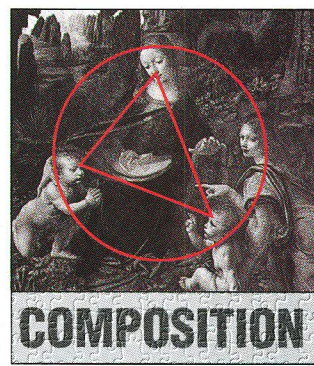
► **SFUMATO**, which means “smoky” in Italian, is a technique in which the painter softens sharp lines so that no figures or objects have outlines. Things are seen as if through a smoky haze.

► **IN THIS PAINTING**, *The Virgin of the Rocks*, baby Jesus is shown with Mary and an angel on the right, who is blessing the child.



CHECK IT OUT!

Can you find where the *sfumato* technique is used?
(answer on back cover)

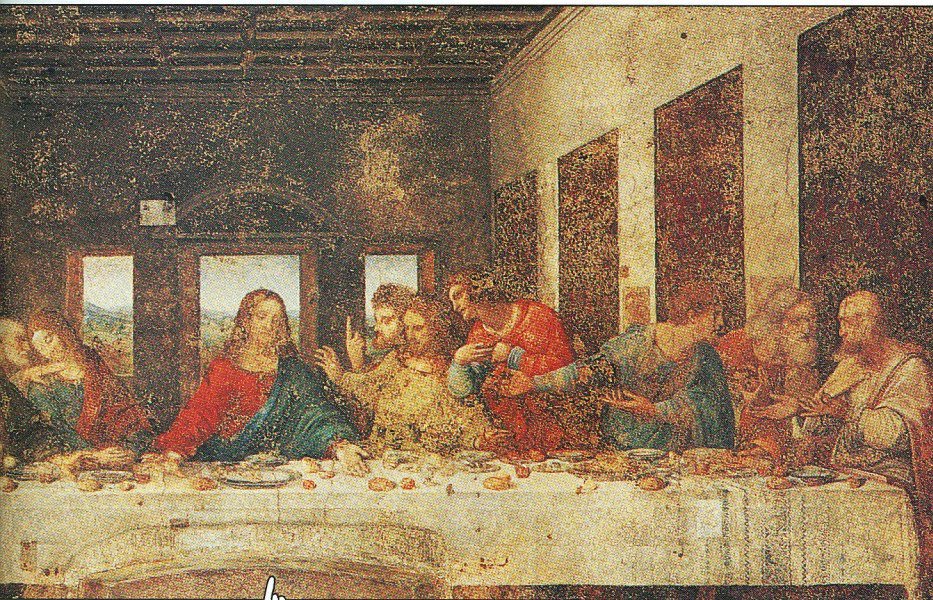


COMPOSITION

▲ **COMPOSITION** refers to the arrangement of the parts of a painting in such a way as to create a unified, harmonious whole. Simple shapes, such as circles and triangles, are used to achieve balance, an idea that became popular during the Renaissance.

in mirror handwriting

and good to pad characters.
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Witch that do not have the



CHECK IT OUT!

The 12 men in this painting, Leonardo's famous *The Last Supper*, are responding to a statement made by Jesus (in the center): “One of you shall betray me.” From the way the disciples are painted, can you guess which one might be the betrayer?

(answer on back cover)

FRESCO

▲ **FRESCO REFERS TO** both a technique and a finished product. As a technique, it was the standard way of doing murals or wall paintings until the sixteenth

century. When using this technique, artists mix powdered colors in water and apply them to damp plaster. As the lime in the plaster dries and the water evaporates, a hard surface forms in which

the color is chemically bonded with the plaster. As a result, the paint doesn't flake, as it did in earlier mural painting. When painting *The Last Supper* (left), Leonardo decided not to use the fresco technique. He experimented with a new technique, but it was unsuccessful: the painting started to flake and has had to be repainted. As a finished product, a fresco is a painting or design done using the fresco technique.

THINK PIECE!

Leonardo believed that a good painter must accomplish two things: accurately represent a person and portray that person's state of mind. What do you think each person is thinking and feeling in Leonardo's *The Last Supper*?

The Man of the Court

Finding a job is never easy, not even back in the “good old days” of the distant past and not even if you’re Leonardo da Vinci, famous artist. So when Leonardo decided to leave Florence for Milan in 1482, he wrote a long letter detailing his talents to the powerful duke, Ludovico Sforza, hoping to get a job. Here’s part of the letter:

Leonardo da Vinci, Artist
 Florence, Italy
 Member, Painter’s Guild

Experience I have a model of very strong but light bridges, extremely easy to carry, by means of which you will be able to pursue or if necessary flee an enemy . . .

During a siege, I know how to dry up the water of the moats and how to construct an infinite number of bridges, covered ways, scaling ladders, and other machines for this type of enterprise.

. . . I know methods of destroying any citadel or fortress, even if it is built on rock.

I also have models of mortars that are very practical and easy to transport, with which I can project stones so that they seem to be raining down; and their smoke will plunge the enemy into terror, to his great hurt and confusion . . .

In peacetime, I think I can give perfect satisfaction and be the equal of any man in architecture . . .

I can carry out sculpture in marble, bronze, and clay; and in painting can do any kind of works as well as any man, whoever he be.

Leonardo

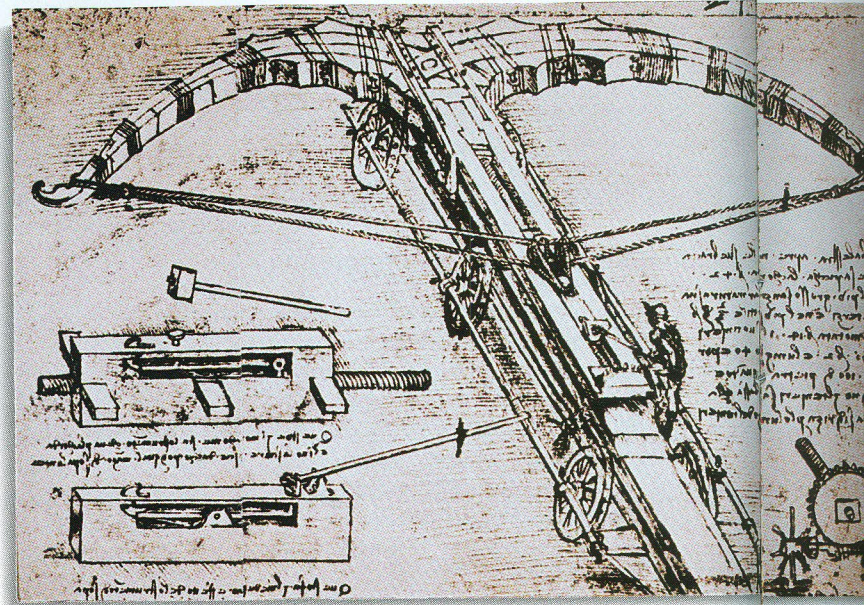
Leonardo landed the job of “Painter and Engineer to the Duke.” As such, he was to make public monuments, paint portraits of people from the court of the duke, and design weapons. Leonardo did all that and more during his 17 years in northwest Italy.

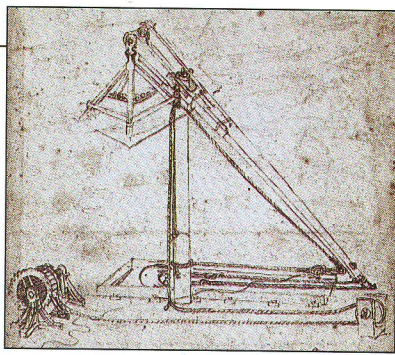
WAR

In spite of Leonardo’s belief that war was “beastly madness,” his letter to the duke

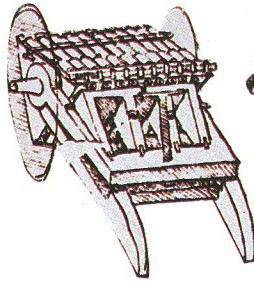
details many military inventions. The Italian city-states were often warring with one another. They were also involved

in a war between France and Spain. Leonardo recognized the importance of being a clever designer of war tools.

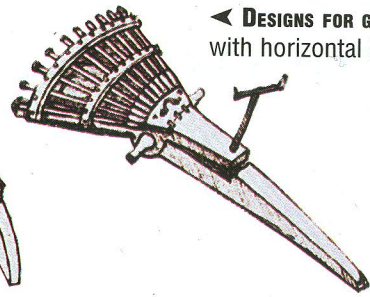




◀ **INSTRUMENT TO** catapult rocks and missiles.



◀ **DESIGNS FOR GUNS** with horizontal barrels.

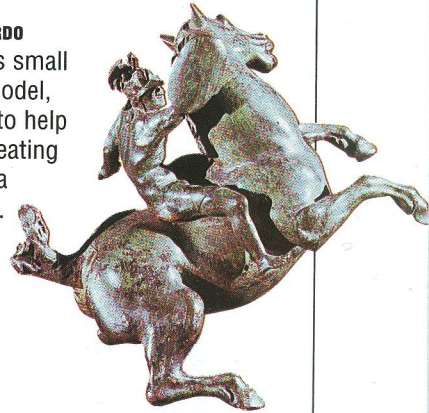


SCULPTURE

▶ One of Leonardo's most ambitious projects was to build an enormous bronze sculpture of Ludovico's father mounted on a rearing horse. To prepare, he studied horses and their movements, observing these powerful creatures from every angle. However, after 12 years, all he produced was a 22-

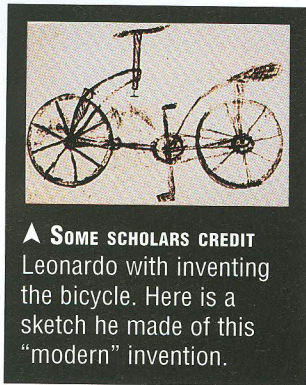
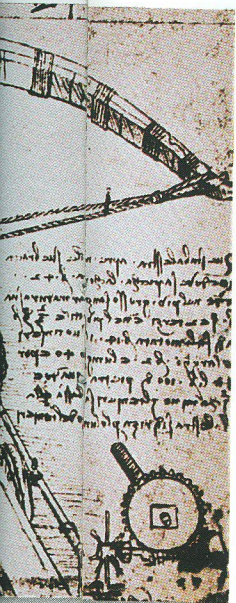
foot-high clay model of a striding horse. Perhaps one reason for the delay was a technical one: he wasn't sure how to cast an enormous rearing horse weighing several tons that could stand on two legs. When the French captured Milan, the clay monument to Sforza was destroyed by French soldiers, who used it for target practice!

▶ **LEONARDO** made this small bronze model, possibly to help him in creating the Sforza sculpture.



One paragraph of Leonardo's letter to the duke probably made a great impression:

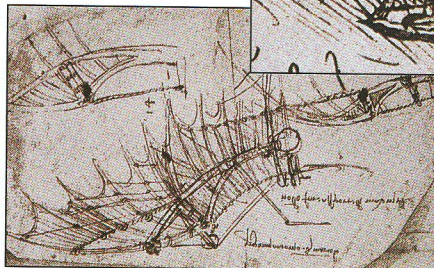
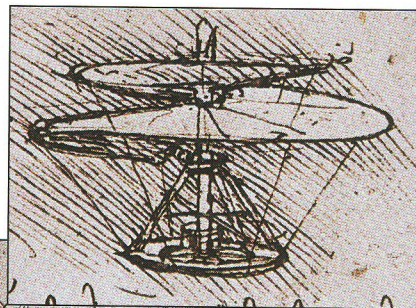
"Moreover, the bronze horse could be made that will be to the immortal glory and eternal honor of the lord your father of blessed memory and of the illustrious house of Sforza."



▲ **SOME SCHOLARS CREDIT** Leonardo with inventing the bicycle. Here is a sketch he made of this "modern" invention.

◀ **GIANT CROSSBOW,** which would have been over 85 feet long!

FLYING MACHINES



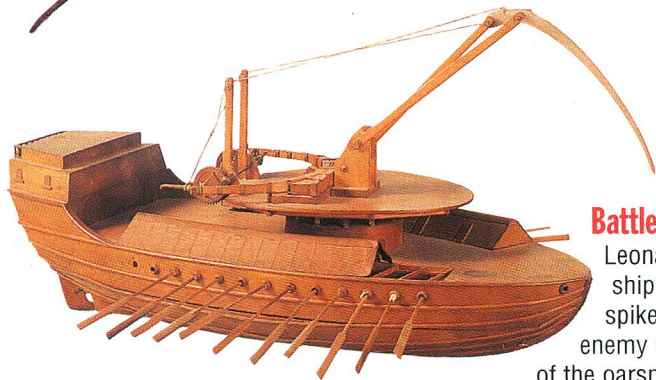
◀ **LEONARDO WAS** convinced that humans could fly, so he carefully studied the flight

of birds. When, at last, he was forced to conclude that humans don't have the muscle power to flap wings, he turned to inventing other things that might help humans get off the ground—the flying screw, for example. This machine is similar to today's helicopters.

Leonardo's Inventions

“Those who are obsessed with practice, but have

These models of Leonardo's inventions were based on the artist's drawings. Most of them can be seen in the Museo della Scienza e della Tecnica, in Milan, Italy.

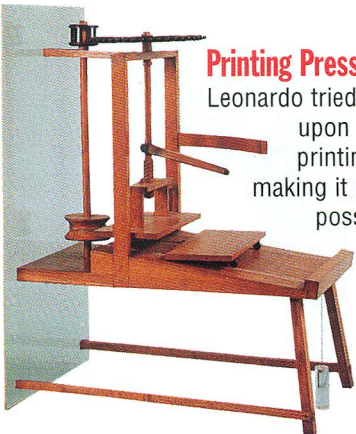
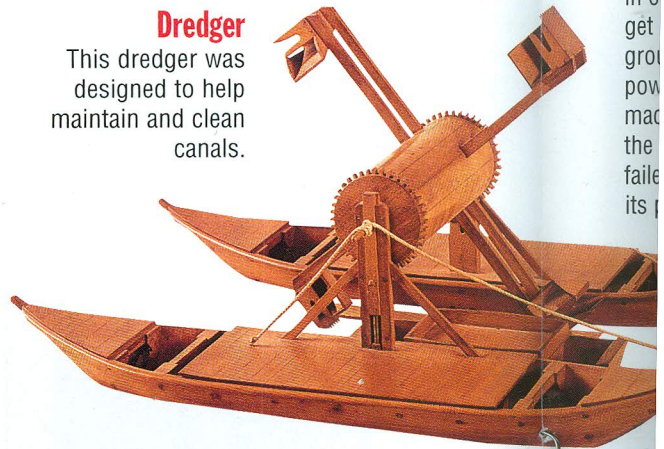


Battleship

Leonardo intended the ship's scorpionlike spike to slice into an enemy ship, with the help of the oarsmen.

Dredger

This dredger was designed to help maintain and clean canals.



Printing Press

Leonardo tried to improve upon Gutenberg's printing press by making it potentially possible for one man to operate it.

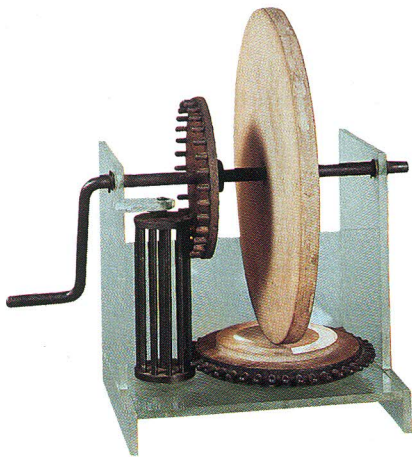


Parachute

Leonardo made a sketch for a parachute 300 years before the first successful jump, in 1797.

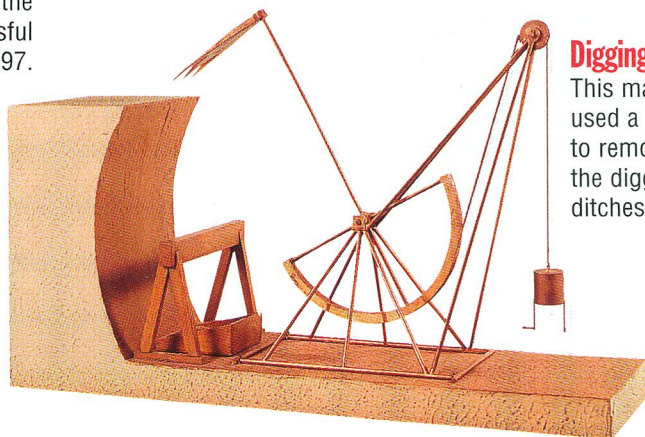
Military Tank

Soldiers battled on horseback in Leonardo's time. This tank forshadows 20th-century warfare.



Mirror Grinder

This machine, for grinding concave mirrors, was to be used in the study of the human eye.



Digging Machine

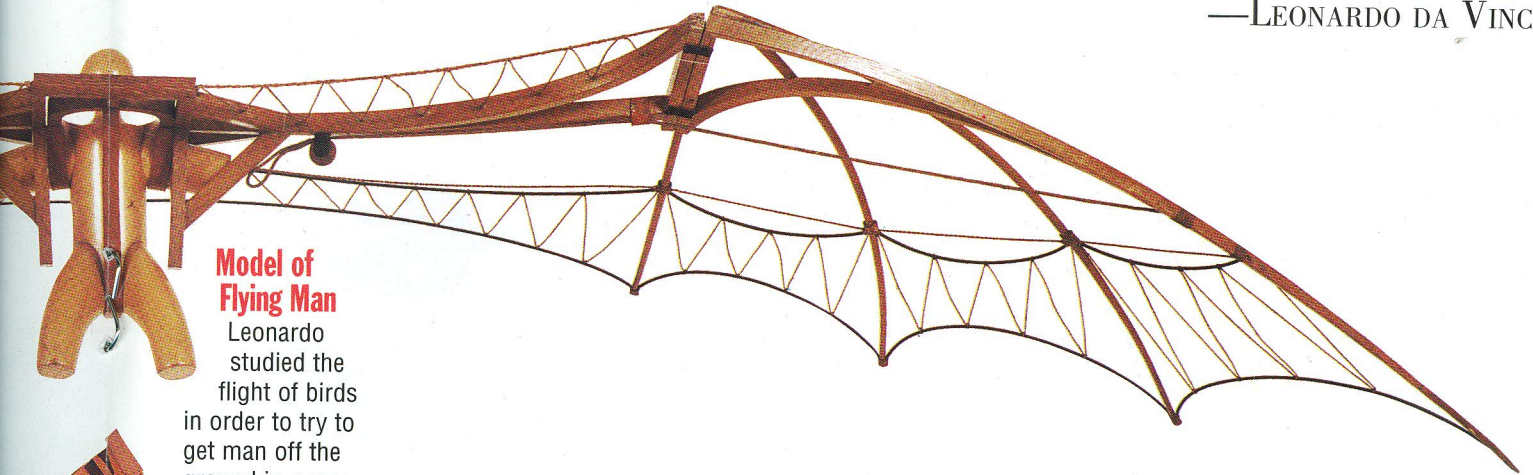
This machine used a metal claw to remove soil in the digging of ditches.

but have no science, are like a pilot out with no tiller or compass....”

—LEONARDO DA VINCI

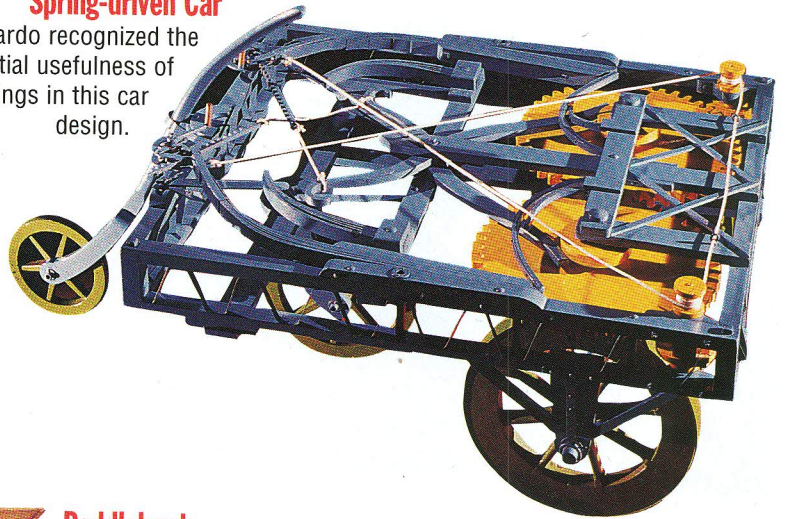
Model of Flying Man

Leonardo studied the flight of birds in order to try to get man off the ground in a man-powered flying machine. Of course, the machine failed to achieve its purpose.



Spring-driven Car

Leonardo recognized the potential usefulness of springs in this car design.



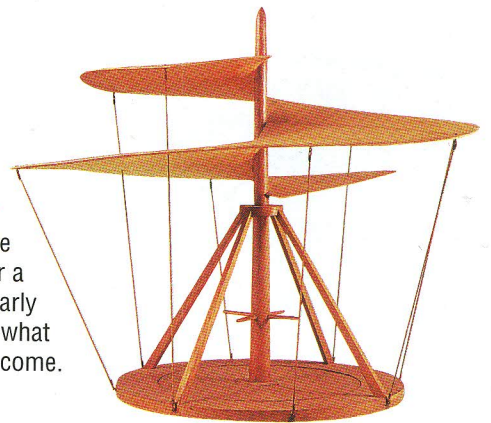
Paddleboat

The use of paddle-wheels makes a boat both powerful and efficient.



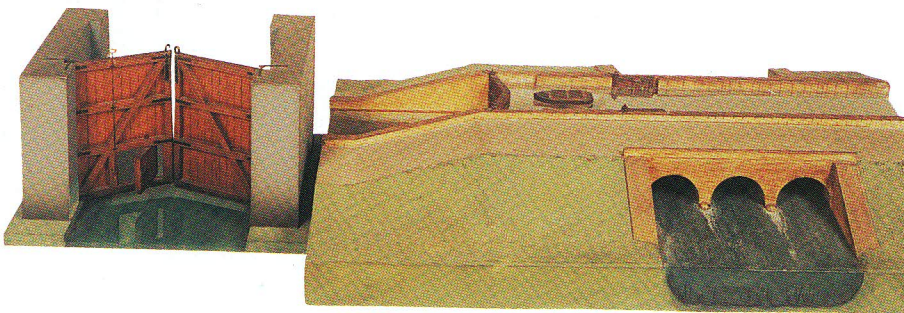
Helicopter

Leonardo made a sketch for a helicopter, an early predictor of what was to come.



Bridge Canal

This bridge canal, with a water overpass, allows water to flow in different directions.



The Man of Many Talents



Leonardo stayed in Milan for 17 years, until the war with France made living there impossible. While in Milan, he produced thousands of pages of sketches of plants, animals, the human body, buildings, people, canals, contact lenses,

Faces

◀ Although Leonardo must have been a serious man, he may also have had a lighter side. Do you think these sketches here are supposed to be monsters, characters for fairy tales, or something else?



Music

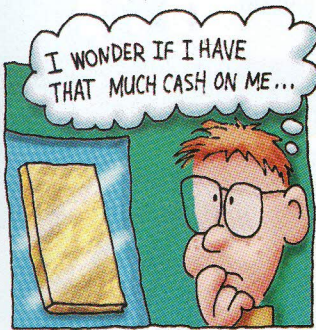
▲ Leonardo was a skilled musician on an instrument called the *lira da braccio*—a stringed instrument similar to a lute. Leonardo constructed his own *lira da bracc-*

cio, and he built a unique drum and a keyboard. When he went to Milan, he took a silver lyre in the shape of a horse's head, which he had made.



Cats

◀ These drawings of cats show Leonardo's sharp powers of observation as well as the swiftness with which he could draw—capturing the animals as they moved.



▲ A notebook of Leonardo's, called the *Codex Leicester*, was sold at auction on November 11, 1994, to Bill Gates, head of Microsoft. He paid thirty million dollars for it!

Plants

▼ Close observation, accurate representation of even

the most complex details, and delicate use of shading typify Leonardo's plant studies.

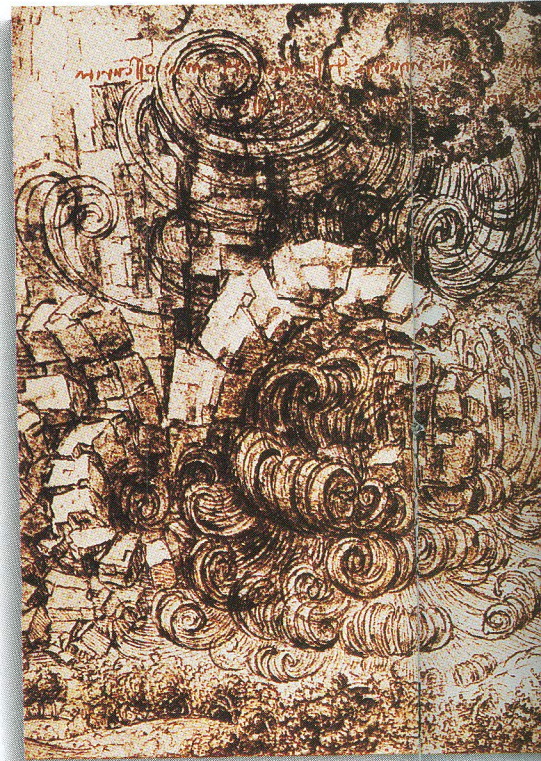


in mirror handwriting

It is not enough to
perceive what you
see, you must
understand what
you see.

Movement of Water

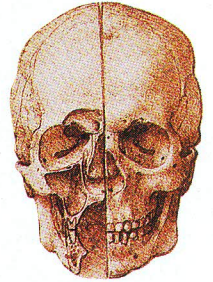
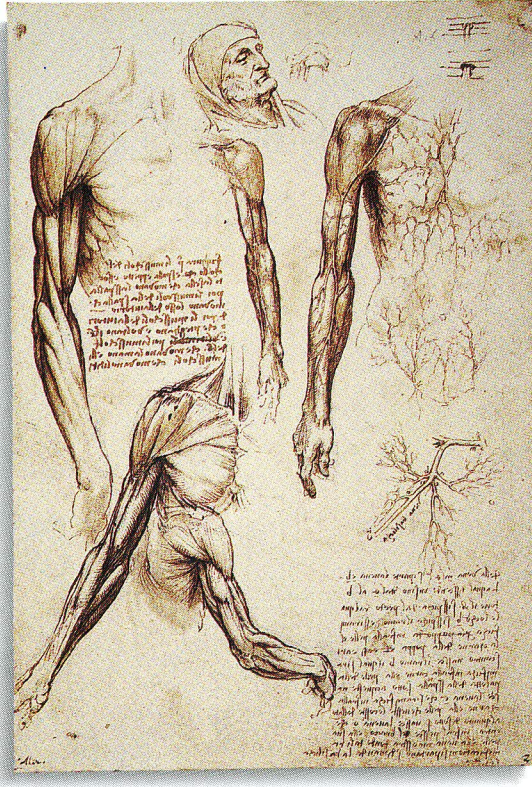
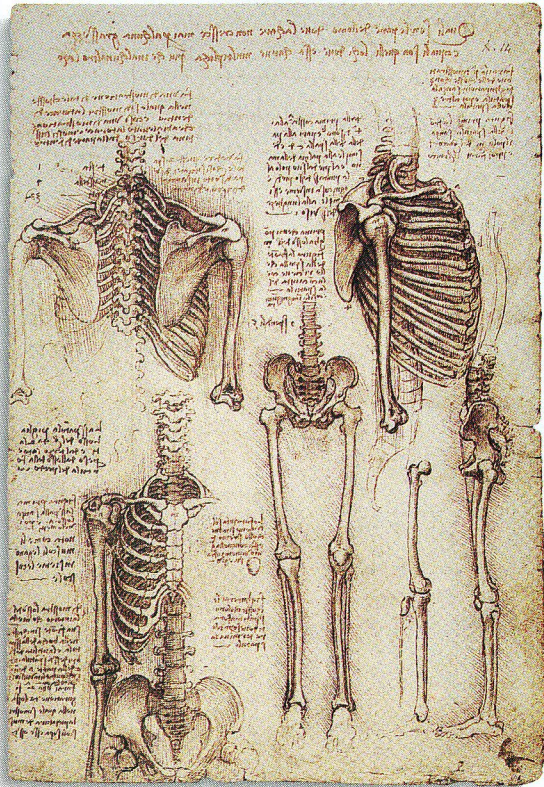
► *Deluges*, a group of drawings, is based on scientific research into the dynamics of water. The drawings show the turbulent, sometimes violent, nature of the movement of water.



bridges, parachutes—and more. The drawings show his remarkable skill as a draftsman and his far-ranging genius. Through careful observation and accurate drawing, Leonardo produced illustrations that aided not only doctors but also

inventors, botanists, and engineers.

Leonardo left Milan in 1500 and traveled in Italy, finally settling again in Florence. In 1516, at the invitation of King Francis I, Leonardo moved to France, where he died in 1519, at age 67.



Anatomy

◀ Leonardo believed that to draw human beings accurately, an artist needed to understand how they were put together—from the inside out. To this end, Leonardo dissected a few dead bodies and made detailed studies of various body parts. He supplemented his findings by dissecting animals, such as an ox.



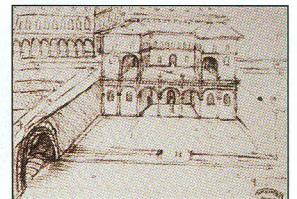
THINK PIECE!



Leonardo was interested in physiognomy (fiz-ee-AHG-nuh-me)—the practice of trying to judge character by observing features of the face. Do you think the artist is successful in revealing character here, in *Profiles of an Old Man and a Youth*?

in mirror handwriting

you will miss
know the center
I'm not a fool



City Planning

▲ Leonardo felt that city overcrowding caused grave problems, so he proposed dividing the huge city of Milan into ten towns of five thousand houses each. This *Drawing for a City on Two Levels* shows his idea for easing overcrowding.



The Mona Lisa became even more famous in 1911 when it was stolen from the Louvre, the museum where it was being shown. Because it was painted on wood, not canvas, it was impossible to roll it up, but the thief nevertheless managed to get it out of the museum. It remained lost for two years, until the thief was caught trying to sell it in his native Italy.

THINK PIECE!



Leonardo believed that a person's soul shows in his or her eyes. How would you describe Mona Lisa's eyes—would you call them kind, piercing, playful, glaring, sad, happy, or some other word?

THINK PIECE!



ing, playful, glaring, sad, happy, or some other word?



THINK PIECE!

The meaning of Mona Lisa's smile has been debated for centuries.

What do you think is the meaning of her smile?

Mona Lisa

A woman, dressed simply in black, sits calmly, one hand placed over the other, her body turned slightly away from the artist. Trees and a lake are in the background. So, what's the big deal? Why is this the most talked-about painting in the world?

Possibly, it's because of the smile. Mysterious, haunting, welcoming, remote, beguiling, enigmatic, beautiful—these are but a small sampling of the words used to describe the famous smile in the most famous painting in the world.

Mona Lisa—aside from inhabiting a painting—was an actual person. Born in 1479, she lived in Florence, Italy, and was married to Francesco del Giocondo, a rich silk merchant, who asked Leonardo to paint a portrait of his wife around 1503. (In Italy, the *Mona Lisa* is known as *La Gioconda*, from Mona Lisa's married name.)

Leonardo spent years working on the painting, adding thin layer upon thin layer to achieve the hauntingly subtle effects of light and shadow. Leonardo loved the painting so much that he kept it for himself, never giving it to the person he painted it for!

Take a good look at this masterpiece. Notice the smile. Why do you think the *Mona Lisa* is the most famous painting in the world?

Other Renaissance Artists

Renaissance art is very different from what came before it. During this time, artists began painting more realistically. They painted portraits of real people,



Sandro Botticelli (1444–1510): *Primavera*

Early Renaissance: Giotto (c. 1267–1337):
The Flight into Egypt

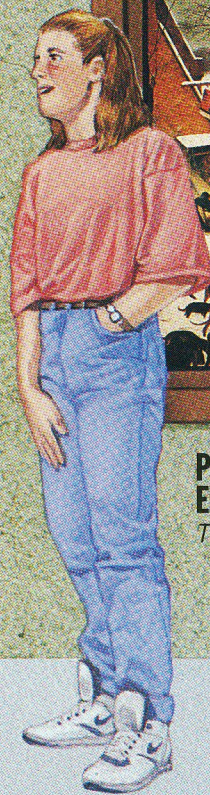


Albrecht Dürer (1471–1521):
Self-Portrait

Donatello
(1386–1466):
Saint George



Pieter Bruegel the Elder (1525/1530–1569):
The Return of the Hunters



using the actual proportions of the human body. Their landscapes are naturalistic, depicting nature as it actually appeared. They used perspective to make their

paintings look as real as possible.

Take a stroll through the Renaissance section of the museum below, and enjoy the work of some of Leonardo's contemporaries.



Hans Holbein the Younger
(1497–1543): *Henry VIII*



Raphael (1483–1520): *Madonna of the Meadow*



Hieronymus Bosch
(c 1450–1516):
The Last Judgment



Michelangelo
(1475–1564):
Pietà