Renaissance:

Raphael (1483-1520) Popular with the popes of the period, Raphael decorated the papal apartments of Julius II, continued to do so under Leo X and, following Bramante, served as architect of St. Peter's. He is credited with revolutionizing portrait painting because of the style he used in the portrait of Julius II. He also designed the "cartoons" that are on the tapestries of the Sistine Chapel. In his painting *The School of Athens*, he reflected the classical influence upon Renaissance art, but he also paid tribute to the men who inspired him by using the faces of Da Vinci, Bramante and Michelangelo as philosophers participating in the debate between Plato and Aristotle.

Donatello (1386-1466) Donatello was a Renaissance artist and sculptor from Florence. He wanted to make paintings and sculptures look real as Greek artists had. He is known for his work in a technique known as **basso rilievo,** a form of shallow relief sculpture (an example of this is the type of sculpture can be found on a coin). Donatello incorporated significant 15th-century developments in central point perspective using basso rilievo. *Saint George and the Dragon* is the best example of this style. His most famous work is the bronze *David*. At the time it was the first known free-standing nude statue produced since ancient times. It is considered the first major work of the Renaissance sculpture. Donatello sculptures can also be found in Filippo Brunelleschi Duomo.

Filippo Brunelleschi- (1377 – April 15, 1446) was one of the foremost architects and engineers of the Italian Renaissance. He is perhaps most famous for inventing **linear perspective** and designing the dome of the Florence Cathedral called the **Duomo**, but his accomplishments also included bronze artwork, architecture (churches and chapels, fortifications, a hospital, etc), mathematics, engineering (hydraulic machinery, clockwork mechanisms, theatrical machinery, etc) and even ship design. His major surviving works are to be found in Florence, Italy

Leonardo Da Vinci (1452-1519) He was a **Renaissance man**, someone who was well educated and excelled in a wide variety of subject or fields. His curiosity drove him to explore many fields of study. His interests included but were not limited to science, math, engineering, invention, anatomy, painting, sculpting, architecture, botany, music and writing. . His most famous painting is a portrait of a woman with a mysterious smile called the **Mona Lisa**. Another important painting was the **Last Supper**, a **fresco** or wet plaster painted on a wall. As a scientist Da Vinci dissected human bodies to study them and used what he learned to make his paintings look more real. As an inventor his notebooks were contained over 5,000 pages and included drawings of bicycles, a machine gun, a submarine, a flying machine and even a parachute.

Michelangelo (1475 – 1564) An Italian Renaissance painter, sculptor, architect, poet, and engineer. He produced a large quantity of work during his lifetime and is best-known works for his two sculptures the *Pietá* and *David*. The pope asked Michelangelo to paint **frescoes** on the ceiling of the Sistine Chapel in the **Vatican**, the home of the pope. He painted stories from the Bible for four years while lying on his back. Many historians believe that this ceiling is one of the greatest masterpieces in the history of art. He was also an architect to Saint Peter's Basilica, believed to be built over the grave of St. Peter it is the greatest structure built during the Renaissance an is also the largest Christian church in the world.

Protestant Reformation:

Martin Luther (1483 –1546) Initiated the Protestant Reformation. He began to question **salvation**, or the eternal happiness of one's soul. In order to raise money the Roman Catholic Church began selling **indulgences**, or pieces of paper that said people would not be punished after death for their sins. Luther thought it was wrong and wrote 95 **theses**, or statements, against indulgences and other actions of the church. Luther called on the church to reform. He believed that first, only faith in Jesus Christ could save people. Second, religious truth came from the Bible, people should read it for themselves and decide what it means. To help people read the Bible he translated it into German. Third, he stated that people do not need the clergy to tell them what the Bible means. (5 million members today)

John Calvin (1509-1564) Almost twenty years after Luther, Calvin created an organized set of protestant beliefs. He wrote a book called *Institutes of the Christian Religion* that contained statements that defended his faith and the doctrine of religious reformers. His book also served as an elementary instruction book for anyone interested in investigating the Christian religion. This book was important because it was the first time that the Protestant movement had a fully organized set of beliefs. Like Luther, Calvin rejected the power of the Pope and stressed the authority of the Bible. He taught that God is all powerful, humans by nature are sinful, God alone decided who would be saved through **predestination** (God determined who would have salvation) Calvin's ideas shaped the Presbyterian church. (4 million member today).

King Henry VIII (1491-1547) King Henry VIII had originally married Catherine of Aragon; since she had been previously married to his brother, though, Henry had to get special papal dispensation (agreement of the Pope) for the marriage. Marrying the wife of one's brother was incest; it was almost equivalent to marrying one's sister. The marriage, however, produced no male children to occupy the throne at Henry's death. Henry began to doubt both of the marriage and the spiritual validity of the marriage. He wished to annul his marriage to Catherine and marry another woman, Ann, because he feared leaving the throne of England without a male heir. In order to marry Ann, the marriage with Catherine had to be annulled by the pope. The pope refused so he split with the Roman Catholic Church. Henry VIII **established the Church of England** and ordered Bibles to be published in English and took much money and land from the church. However, Henry did this for political gains, not because he supported the ideas of Luther. His actions Henry VIII laid the foundations of Protestantism in England which under the rule of Edward and Elizabeth would transform England from a Catholic to a Protestant nation.

Queen Elizabeth (1533-1603) The reign of Queen Elizabeth I is often referred to as ***The Golden Age*** of English history. After being crowned in 1559, she re-established the Protestant Church in England and restored the economy. She was a committed Protestant, and reputedly spent time in prayer every day.Perhaps to appease Catholics or to appease those who did not believe a woman could become head of the church, Elizabeth became Supreme Governor of the Church of England (13.4 million members today and *mother church* of the worldwide Anglican church), rather than Supreme Head as her father had been. Elizabeth and her advisors saw the threat of a Catholic crusade against heretical England. Elizabeth sought a Protestant solution that would not offend Catholics too greatly while addressing the desires of English Protestants; she would not tolerate the more radical Puritans though, who were pushing for far-reaching reforms. Elizabeth was an immensely popular Queen. She is still one of the best loved monarchs, and one of the most admired rulers of all time. She became a legend in her own lifetime, famed for her remarkable abilities and achievements.

Johann Gutenberg-(c.1397-1468) Gutenberg first designed type that would space evenly on a page and also look pleasing to the eye. His first type was cast of the metals lead, antimony, and tin and consisted of two-hundred and ninety separate symbols. Gutenberg also had to find an ink that would not fade or be to thick and came up with the combination of boiled linseed oil and soot. Gutenberg adapted a wine press for printing that was waste high and had a rolling tray so that he could slide the paper in and out. The press would also allow him to also squeeze water out of the damp paper while printing at the same time. The Gutenberg Bible, printed in 1455, was the first Bible ever printed and the first book ever printed in Europe. Gutenberg printed two-hundred copies of this book which was known as a 36-line Bible for the number of lines that were on each page. Gutenberg's invention sparked many religious revolutions with his invention that allowed the common man to posses a Bible for his own interpretation. The printing press allowed knowledge and ideas to be passed from one man to the other and paved the way for schools and media.

Scientific Revolution-

Nicolaus Copernicus (1473 – 1543) Copernicus is said to be the founder of modern astronomy. Copernicus was a mathematician, astronomer, physician, classical scholar, translator, artist, Catholic cleric, jurist, governor, military leader, diplomat and economistIn 1530, Copernicus completed *De Revolutionibus*, which asserted that the earth rotated on its axis once daily and traveled around the sun once yearly: a fantastic concept for the times called the heliocentric theory. Up to the time of Copernicus the thinkers of the western world believed in the Ptolemiac theory that the universe was a closed space bounded by a spherical envelope beyond which there was nothing. The most important aspect of Copernicus' work is that it forever changed the place of man in the cosmos; no longer could man legitimately think his significance greater than his fellow creatures; with Copernicus' work, man could now take his place among that which exists all about him, and not of the premier position of being at the center of the universe.

Galileo Galilei (1564 –1642)was an Italian physicist, mathematician, astronomer, and philosopher who played a major role in the Scientific Revolution. His achievements include improvements to the telescope and consequent astronomical observations, and support for Copernicus' ideas. Galileo has been called the "father of modern observational astronomy", the "father of modern physics", the "father of science" The motion of uniformly accelerated objects, taught in nearly all high school and introductory college physics courses, was studied by Galileo as the subject of kinematics. His contributions to observational astronomy include the telescopic confirmation of the phases of Venus, the discovery of the four largest satellites of Jupiter(named the Galilean moons in his honor), and the observation and analysis of sunspots. Galileo also worked in applied science and technology, improving compass design. In1632, he was tried by the Inquisition, found "vehemently suspect of heresy," forced to recant, and spent the rest of his life under house arrest.

Francis Bacon (1561 –1626)was an English philosopher, statesman, scientist, lawyer, jurist, and author. He served both as Attorney General and Lord Chancellor of England. Although his political career ended in disgrace, he remained extremely influential through his works, especially as philosophical advocate and practitioner of the scientific revolution. Indeed, his dedication may have brought him into a rare historical group of scientists who were killed by their own experiments. His works established and popularized an inductive methodology for scientific inquiry, often called the *Baconian method* or simply, the **scientific method.** His demand for a planned procedure of investigating all things natural marked a new turn in the rhetorical and theoretical framework for science, much of which still surrounds conceptions of proper methodology today.

Johannes Kepler- (1571 –1630) was a German mathematician, astronomer and astrologer, and key figure in the 17th century scientific revolution. He is best known for his laws of planetary motion by expanding Copernicus's heliocentric view of the earth. He furthered this research by determining that the earth and planets rotate not in perfect circles but as an ellipse. He also **provided one of the foundations for Isaac Newton's theory of universal gravitation**. He also did fundamental work in the field of optics, invented an improved version of the refracting telescope (the Keplerian Telescope), and helped to legitimize the telescopic discoveries of his contemporary Galileo Galilei. Kepler also incorporated religious arguments and reasoning into his work, motivated by the religious conviction that God had created the world according to an intelligible plan that is accessible through the natural light of reason. Kepler described his new astronomy as "celestial physics", as "an excursion into Aristotle's *Metaphysics*", and as "a supplement to Aristotle's *On the Heavens*", transforming the ancient tradition of physical cosmology by treating astronomy as part of a universal mathematical physics.

Sir Isaac Newton(1643 –1727) was an English physicist, mathematician, astronomer, natural philosopher, alchemist, and theologian who is perceived and considered by a substantial number of scholars and the general public as one of the most influential men in history His 1687 publication of the *Philosophiæ Naturalis Principia Mathematica* (usually called the *Principia*) is **considered to be among the most influential books in the history of science**, laying the groundwork for most of classical mechanics. In this work, Newton described universal **gravitation** and the three laws of motion which dominated the scientific view of the physical universe for the next three centuries. Newton showed that the motions of objects on Earth and of celestial bodies are governed by the same set of natural laws by demonstrating the consistency between Kepler's laws of planetary motion and his theory of gravitation, thus removing the last doubts about heliocentrism and advancing the scientific revolution. Newton also built the first practical **reflecting telescope** and developed a theory of color based on the observation that a prism decomposes white light into the many colors that form the visible spectrum. He also formulated an empirical law of cooling and studied the speed of sound. In mathematics, Newton shares the credit with Gottfried Leibniz for the development of the differential and integral **calculus**. He also demonstrated the generalized binomial theorem, developed the so-called "Newton's method" for approximating the zeroes of a function, and contributed to the study of power series.