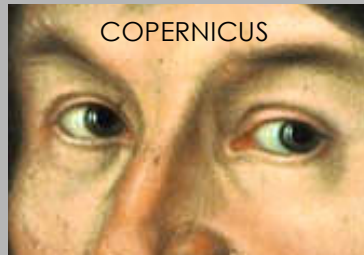


# PIONEERS OF THE SCIENTIFIC REVOLUTION



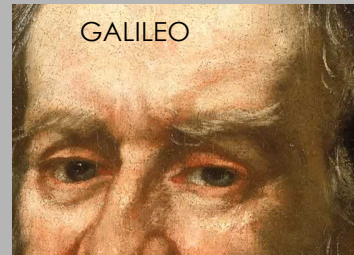
COPERNICUS

HELIOCENTRIC THEORY



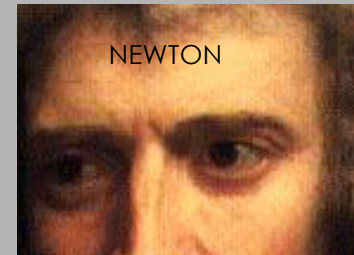
KEPLER

ELLIPTICAL ORBITS



GALILEO

TELESCOPE



NEWTON

GRAVITY



HARVEY

BLOOD CIRCULATION

- Emphasis on **REASON** and systematic observation of **NATURE**
- Formation of **SCIENTIFIC METHOD**; Expansion of Scientific Knowledge

## SCIENTIFIC REVOLUTION & *Enlightenment*



## NEW SCHOOLS OF ART, MUSIC, & LITERATURE



Bach → Baroque

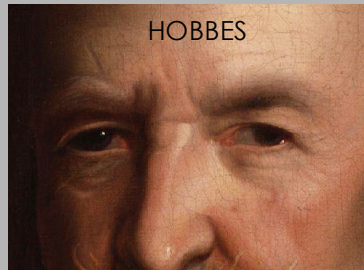
Mozart → Classical



Delacroix → Romantic

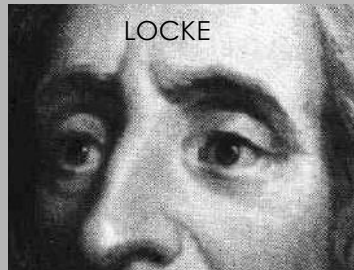
Cervantes → Novelist

# ENLIGHTENMENT THINKERS & THEIR IDEAS



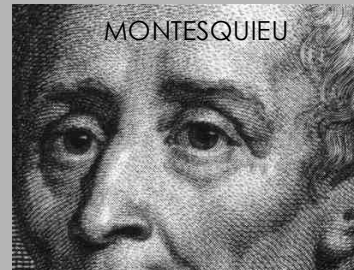
HOBBS

CONSENT TO GOVERN  
FOR SELF PROTECTION



LOCKE

PEOPLE ARE SOVEREIGN;  
LIFE, LIBERTY & PROPERTY



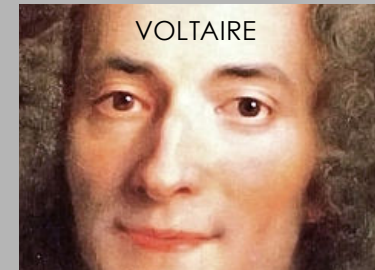
MONTESQUIEU

SEPERATION OF POWERS



ROUSSEAU

SOCIAL CONTRACT



VOLTAIRE

RELIGIOUS TOLERATION

- Applied **REASON** to the Human World; Stimulated **RELIGIOUS TOLERANCE**
- Fueled **DEMOCRATIC REVOLUTIONS** worldwide (USA, France, Latin America)

# THE CASE OF GIORDANO BRUNO

(or, WHY YOU SHOULD NEVER CHALLENGE  
THE CATHOLIC CHURCH ON ANYTHING EVER)



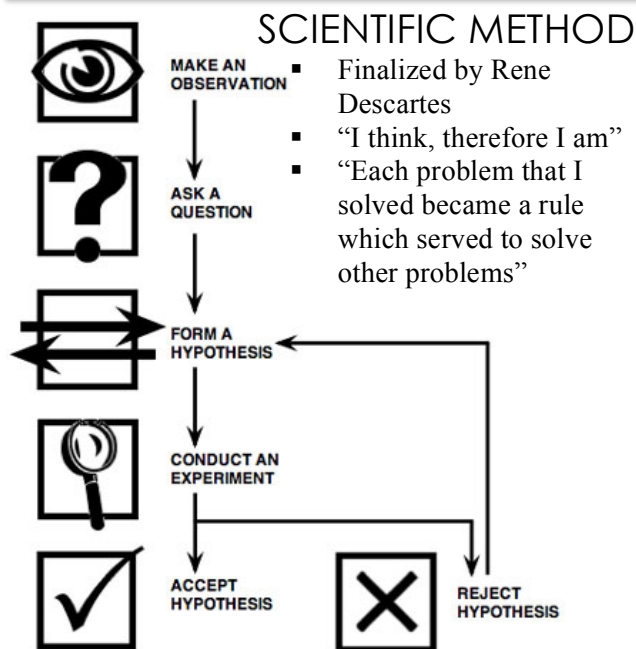
Giordano Bruno was born in 1548. He became a priest at the age of 24. He was honored at an early age by Pope Pius V for his "art of memory". In 1576, he fled after being caught with a banned book (Erasmus' *In Praise of Folly*). He travelled all over Italy, Switzerland, France, and England. Bruno backed the Copernican views of the universe. He went further to claim that our sun is just another star and that the other stars in the sky were other "suns". He even thought that there were other planets around these other "suns", on which other intelligent beings might live. These views ran counter to the Catholic Church's view and he was sentenced to death (in the same room where Galileo would be tried). He was burned at the stake on February 17, 1600 in Rome (where a statue of him resides today).

# PROBLEM:

YOU ARE A STUDENT AT STONE BRIDGE HIGH SCHOOL. YOU HAVE JUST BEEN INFORMED THAT AN EVIL TEACHER HAS PLANNED TO GIVE YOU HOMEWORK. HOWEVER, THIS DIABOLICAL GENIUS HAS LEFT YOU A WAY OUT... IF YOU CAN SOLVE THE FOLLOWING RIDDLE, THERE WILL NOT ONLY BE NO HOMEWORK, BUT YOU WILL BE SHOWERED WITH PRAISE BY YOUR FELLOW CLASSMATES WHO YOU WILL SAVE FROM THE TORMENT OF A NIGHT OF LEARNING. YOU WILL BECOME LEGEND AS THE SAVIOR OF THE DAY...

## HERE IS THE RIDDLE...

YOU HAVE TWO CONTAINERS. ONE 3-GALLON JUG AND ONE 5-GALLON JUG. YOU MUST FILL ONE OF THE JUGS WITH EXACTLY 4 GALLONS. YOU MUST PLACE THE 4 GALLONS ON A SCALE FOR MEASUREMENT. IF YOU ARE OFF BY A FEW OUNCES, IT MEANS DISASTER FOR YOUR CLASSMATES. YOU HAVE 5 MINUTES.



## SCIENTIFIC REVOLUTION & Enlightenment



DIDEROT's

## ENCYCLOPEDIA

- Attempted to create a large set of books encapsulating all of man's knowledge
- 17 Volumes
- 75,000 Entries
- 20,000,000 words
- Contributors:
  - Diderot
  - Montesquieu
  - Rousseau
  - Voltaire
- Goal:
  - To "change men's common way of thinking"
- Published from 1751-1772





# SCIENTIFIC REVOLUTION & *Enlightenment*



# PRIMARY SOURCES

Read the following excerpts from the Scientific Revolutionaries and summarize their **MAIN IDEA** in one sentence.



COPERNICUS

## NICOLAI COPERNICITOT- RINENSIS DE REVOLVTIONI- bus orbium coelestium, Libri vi.

IN QVIBVS STELLARVM ET FI-  
XARVM ET ERRATICARVM MOTVS, EX VETE-  
ribus atq; recentibus obseruationibus, restituit hic autor.  
Præterea tabulas expeditas luculentasq; addidit, ex quib-  
us eisdem motus ad quoduis tempus Mathe-  
maticum studiosus facillime calcu-  
lare poterit.

ITEM, DE LIBRIS REVOLVTIONVM NICOLAI  
Copernici Narratio prima, per M. Georgium Joachim  
Philem ad D. Ioann. Schoen

“From this supposition follows another question of no less importance, concerning the place of the earth, although it has been accepted and believed by almost all, that the earth occupies the middle of the universe. But if one should suppose that the earth is not at the center of the universe, that, however, the distance between the two is not great enough to be measured on the orbits of the fixed stars, but would be noticeable and perceptible on the orbit of the sun or of the planets: and if one was further of the opinion that the movements of the planets appeared to be irregular as if they were governed by a center other than the earth, then such an one could perhaps have given the true reasons for the apparently irregular movement.”  
SUMMARY: \_\_\_\_\_

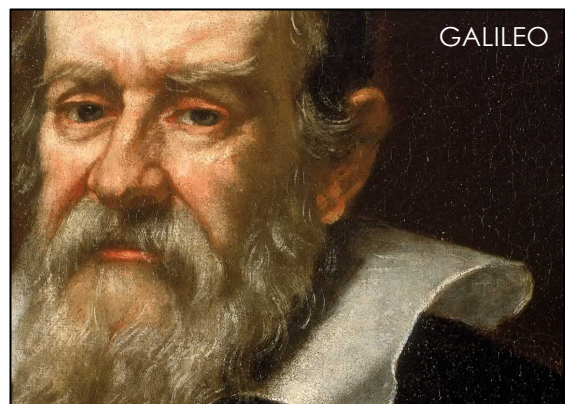


KEPLER

## ASTRONOMIA NOVA AITIOAOPHTOS, SEV PHYSICA COELESTIS, tradita commentariis DE MOTIBVS STELLÆ MARTIS,

A S. C. M. S. Mathematico  
JOANNE KEPLERO,

“...we must choose between two assumptions: either the souls which move the planets are the less active the farther the planet is removed from the sun, or there is only one moving soul in the center of all the orbits, that is the sun, which drives the planet the more vigorously the closer the planet is, but whose force is quasi-exhausted when acting on the outer planets because of the long distance and the weakening of the force which it entails.”  
SUMMARY: \_\_\_\_\_



GALILEO

## NVNCIVS MAGNA, LONGEQVE ADMIRABILIA Spectacula pandens, suspiciendæque proponens vniciuicq; præsertim verò PHILOSOPHIS, atq; ASTRONOMIS, qua à GALILEO GALILEO PATRITIO FLORENTINO Patauini Gymnasij Publico Mathematico PERSPICILLI Nuper à se reperi bene fieri sunt obseruati in LVNÆ, F. ACIE, FIXIS IN- NUMERIS, LACTEO CIRCVLO, STELLIS NEBVLISIS, Aprime verò in QVATVOR PLANETIS Circa IOVIS Stellam disparibus intervalis, atque periodis, celesti- tate mirabili circumuolutis; quos, nemini in hanc vsq;e diem cognitos, nouissimè Author depre- hendit primus; atque MEDICEA SIDERA NVNCVPANDOS DECREVIT.

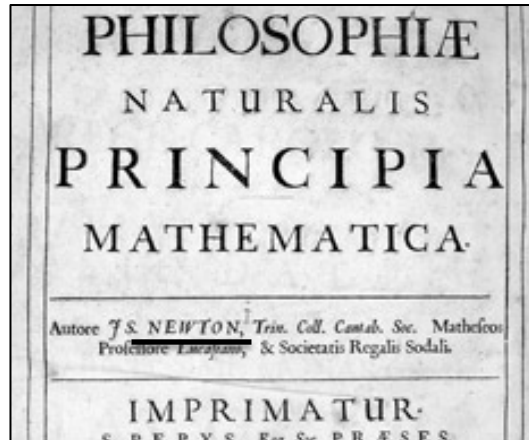
“Whereas you, Galileo were denounced in 1615, to this Holy Office, for holding as true a false doctrine taught by many, namely, that the sun is immovable in the center of the world... by the desire of (this) Inquisition, the two propositions of the stability of the sun, and the motion of the earth, were qualified by the Theological Qualifiers as follows:  
1. The proposition that the sun is in the center of the world and immovable from its place is absurd, philosophically false, and formally heretical; because it is expressly contrary to Holy Scriptures.  
2. The proposition that the earth is not the center of the world, nor immovable, but that it moves, and also with a diurnal action, is also absurd, philosophically false, and, theologically considered, at least erroneous in faith.”

SUMMARY: \_\_\_\_\_





NEWTON



"A particle will stay at rest or continue at a constant velocity unless acted upon by an external unbalanced net force."

"Every action has an equal and opposite reaction."

"If I have seen further it is by standing on the shoulders of giants"

SUMMARY: \_\_\_\_\_

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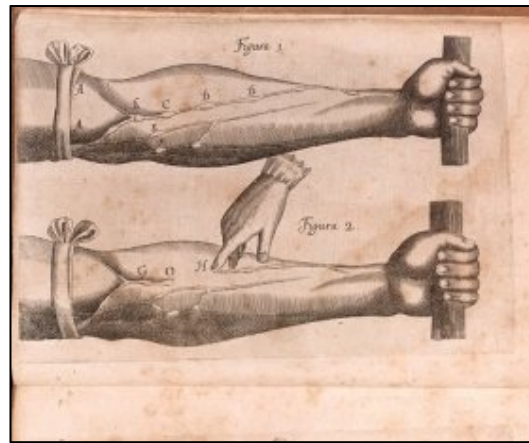
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HARVEY



"The heart, consequently, is the beginning of life; the sun of the microcosm, even as the sun in his turn might well be designated the heart of the world; for it is the heart by whose virtue and pulse the blood is moved, perfected, and made nutrient, and is preserved from corruption and coagulation; it is the household divinity which, discharging its function, nourishes, cherishes, quickens the whole body, and is indeed the foundation of life, the source of all action."

SUMMARY: \_\_\_\_\_

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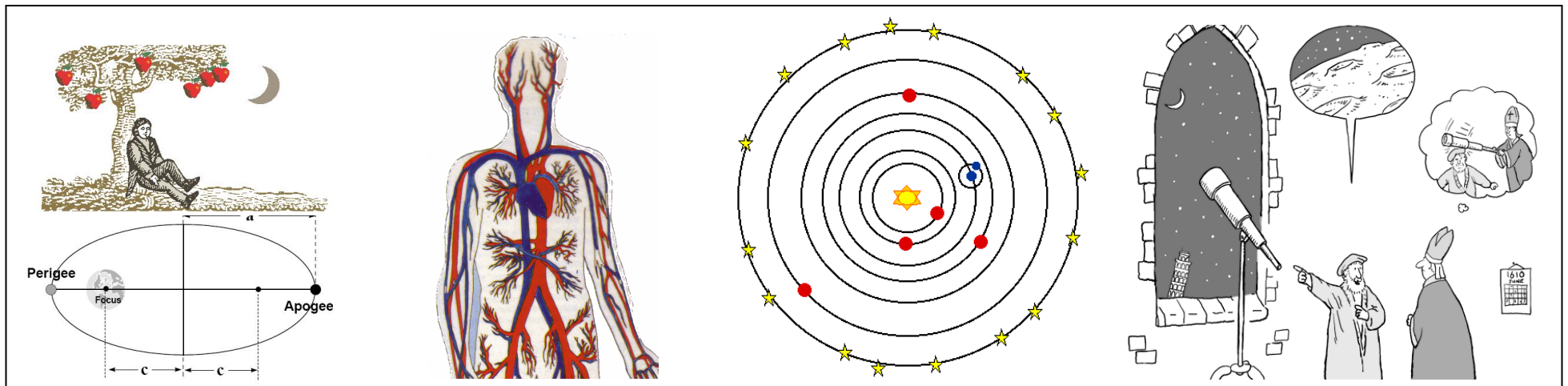


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Associate the following pictures to the scientists mentioned above



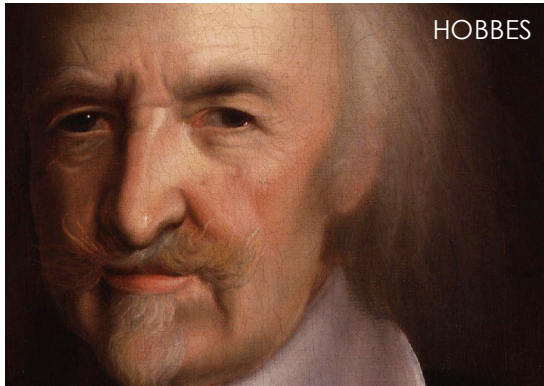


## SCIENTIFIC REVOLUTION & *Enlightenment*



# PRIMARY SOURCES

Read the following excerpts from the Enlightenment thinkers and summarize their **MAIN IDEA** in one sentence.



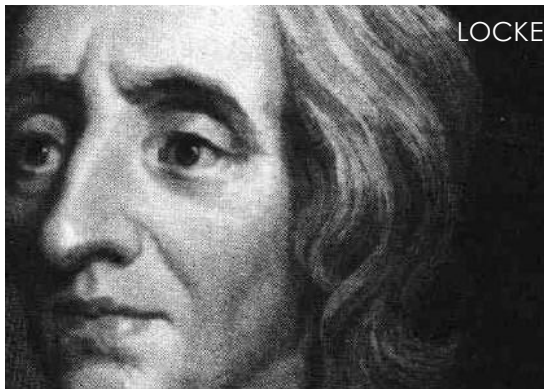
HOBBS



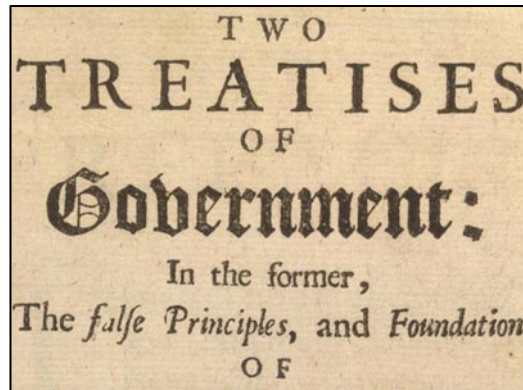
“Nature hath made men equal... Therefore, if two men desire the same thing which they cannot both enjoy, they become enemies, and seek each the destruction of the other. Hence, while men live without a common power to keep them all in awe, they are in a state of war, every man against every man.

“Now, men may agree together; but there is no security, unless there be a power to enforce the covenant (agreement). Such a power can be created only if they agree together to confer all their own power on one man... This is the generation of that **LEVIATHAN**, to which we owe our peace and defense.”

SUMMARY: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



LOCKE



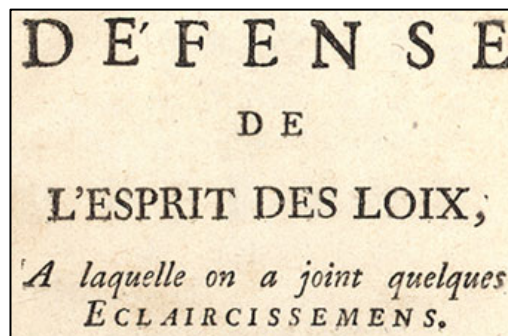
“All mankind... being all equal and independent, no one ought to harm another in his life, liberty or property. (Thus being the reason for having a government).

“Those grants that God made of the world to Adam and to Noah and his sons, it is very clear that God has given the earth to the children of men, giving it to mankind in common. (He also questioned if Divine Right was true since it derived from Biblical Adam, then why isn't there just one king?)

SUMMARY: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



MONTESQUIEU



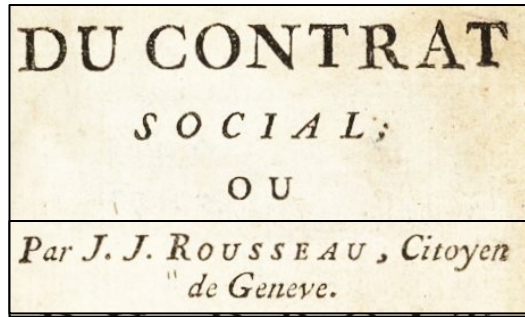
“In every government, there are three sorts of power; the Legislative, the Executive, and (the Judicial). The first... enacts temporary and perpetual laws... The second, makes peace, war and sends or receives embassies (from other countries)... the third, punishes criminals and settles disputes. When the legislative and executive powers are united in the same person, or same body... THERE CAN BE NO LIBERTY, lest the same person or body should enact tyrannical laws, to execute them in a tyrannical manner.

SUMMARY: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_





ROUSSEAU



“Every law the people has not ratified in person is null and void — is, in fact, not a law.”  
 “Man is born free, and yet we see him everywhere in chains.”  
 “The problem is to find a form of association which will defend and protect with the whole common force the person and goods of each associate.”  
 SUMMARY: \_\_\_\_\_



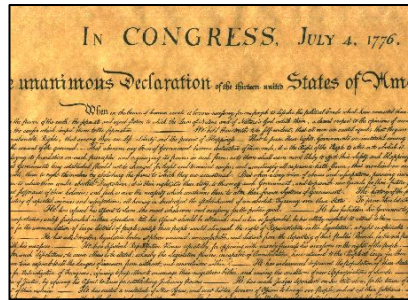
VOLTAIRE



“It does not require great art, or magnificently trained eloquence, to prove that Christians should tolerate each other. I, however, am going further: I say that we should regard all men as our brothers. What? The Turk my brother? The Chinaman my brother? The Jew? The Siam (Thai)? Yes, without doubt; are we not all children of the same father and creatures of the same God?”  
 SUMMARY: \_\_\_\_\_

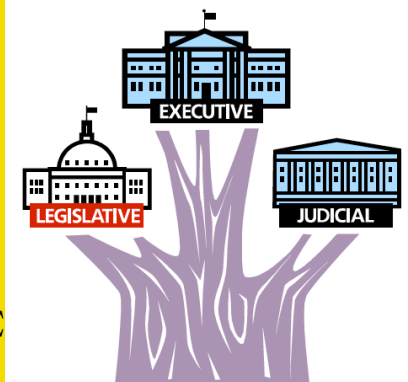


JEFFERSON



“We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness.-- That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed, --That whenever any Form of Government becomes destructive of these ends, it is the Right of the People to alter or to abolish it, and to institute new Government.”  
 “[N]o man shall be compelled to frequent or support any religious worship, place, or ministry whatsoever... but that all men shall be free to profess, their opinions in matters of religion”  
 SUMMARY: \_\_\_\_\_

Associate the following pictures to the philosophers mentioned above





## SCIENTIFIC REVOLUTION & *Enlightenment*



# Bach & Mozart

Throughout the course of the 17<sup>th</sup> & 18<sup>th</sup> centuries (1600-1700s), several new musicians revolutionized music. Two of these composers were Johann Sebastian Bach and Wolfgang Amadeus Mozart.

*Johann Sebastian Bach.*



## JOHANN SEBASTIAN BACH

(1685-1750; GERMANY)

- Greatest Baroque Composer... Ever.

Baroque (n)- Western style of music following the Renaissance and preceding the Classical era. Expanded the size, range, and complexity of instrumental performances. Established Opera as a musical genre.

- Died after complications from eye surgery

## WOLFGANG AMADEUS MOZART

(1756-1791; AUSTRIA)

- Greatest Classical Composer... Ever
  - Lighter, less complex than Baroque
- Lived only 35 years
- Child Prodigy
  - Wrote and performed a symphony at the age of 5
  - Travelled and performed with his family (Jackson 5-style)
- Loved practical jokes and “sophomoric” humor



*Wolfgang Amadeus Mozart*



# DELACROIX & CERVANTES

Mozart and Bach weren't the only people shaking up the arts. There were also major changes in art and literature as well. Romantic art became en vogue in response to the logic and reason of the Enlightenment. The novel, a new form of literature, created an entirely new genre that has come to dominate literature ever since.

## SCIENTIFIC REVOLUTION & *Enlightenment*



# Eug. Delacroix



On the 350<sup>th</sup> anniversary of its release, Pablo Picasso painted this tribute to his fellow countryman.

### TOP 100 BOOKS OF ALL TIME

(According to the World Library)

*Things Fall Apart*, Achebe  
*Fairy Tales*, H.C. Anderson  
*Divine Comedy*, Dante  
*Gilgamesh*, Anon  
*Book of Job*, Anon  
*Mahabharata*, Vyasa  
*Njal's Saga*, Anon  
*1,001 Nights*, Anon  
*Pride & Prejudice*, Austen  
***Don Quixote*, Cervantes**  
*Canterbury Tales*, Chaucer  
*Great Expectations*, Dickens  
*Odyssey*, Homer  
*1984*, Orwell  
*Huckleberry Finn*, Twain  
*Ramayana*, Valmiki



## EUGENE DELACROIX

(1798=1863; FRANCE)

- Prolific French Painter (9,000+ Paintings)
- ROMANTIC ARTIST
  - Counter-Enlightenment
  - Ran contrary to Reason, Logic, and Science
  - Emphasized intuition, imagination, and feeling
- Most famous work: *Liberty Leading the People* (Louvre)
  - Painted during the 1830 French Revolution
- Appeared on the French 100 Franc note in 1993

## MIGUEL DE CERVANTES

(1547=1616; SPAIN)

- Wrote *Don Quixote*
  - One of the first NOVELS; (1<sup>st</sup>= Tale of the Genji 11<sup>th</sup> Cent.)
  - World Library list above ranked the Top 100 books of all time, considering them all equally good except for *Don Quixote*
    - Calls it "the best literary work ever written"