

New Worldviews and Ways of Life,  
1500–1800s  
Western Modernization

# Western Modernization

This lecture we will go over some of the great **scientific ideas** and **philosophies** of a **remarkable period** with special reference to how, and who had helped to **change** the world **scientifically**, **religiously**, economically and **philosophically**, this era is called:

**The Age of Scientific Revolution & Enlightenment!**

# In this lecture:



New Worldviews and Ways of Life,  
1500–1800s  
Western Modernization

1. How did it start?
2. What were the scientific thoughts in the Early 1500s?
3. What revolutionary discoveries were made in the 16<sup>th</sup> and 17<sup>th</sup> centuries?  
Why did they occur in Europe?
4. What is the Age of Enlightenment?
5. What are the ideas that created such a fuss and changed history forever?
6. How did the philosophes influence the Age of Enlightenment?

# Scientific Revolution

- The introduction of the scientific method transformed society by using **science** and **reason** rather than **political** or **religious dogma** to explain **natural phenomena**.
- There is no doubt that the **Protestant Reformation** encourages both **religious** and **scientific** thought.
- <https://www.youtube.com/watch?v=kXcVfx2Pw1I>

# How did it start?

- Of course, our great **Greek Philosophers, Plato, Aristotle**, and many others who took from Ancient **Egypt** and **Mesopotamia**, had developed many ideas, and theories about nature and different sciences.
- Also, **the Arabs** and **Persian** were remarkable in **mathematics, Algebra, the decimal point notation, astronomy, medicine, and physics.**



Plato & Aristotle



The Sphinx



Giza Pyramids

# How did it start?

- **China** was also a vital center of scientific activity, big achievements, **papermaking, compass, and gunpowder**.
- And of course, the **Renaissance** and the **Reformation** were the main inspiring period.
- **Renaissance humanists** focused on **art** and **literature** and other worldly matters.
- There is no doubt that the **Protestant Reformation** encourages both religious and **scientific thought**.
- **Enlightenment thinkers** believed that their era could produce fresh **intellectual** progress.



Ancient Chinese compass



China  
Gunpowder



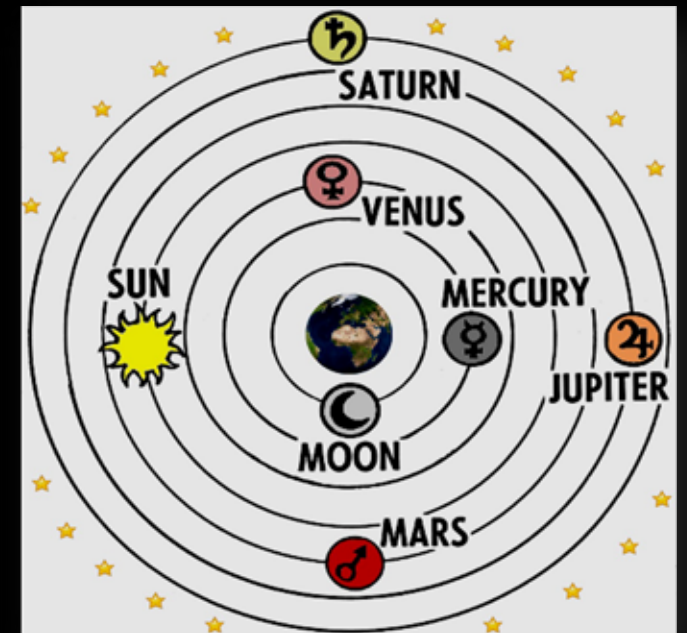
# What were the scientific thoughts in the Early 1500s?

## A. Natural Philosophy

- Natural philosophy can be identified as a precursor to the field of modern science.
- Natural philosophy focused on questions about the nature of the universe, its purpose, and its function.
- Natural philosophy was based on the ideas of ancient classical thinkers such as Aristotle and Ptolemy.



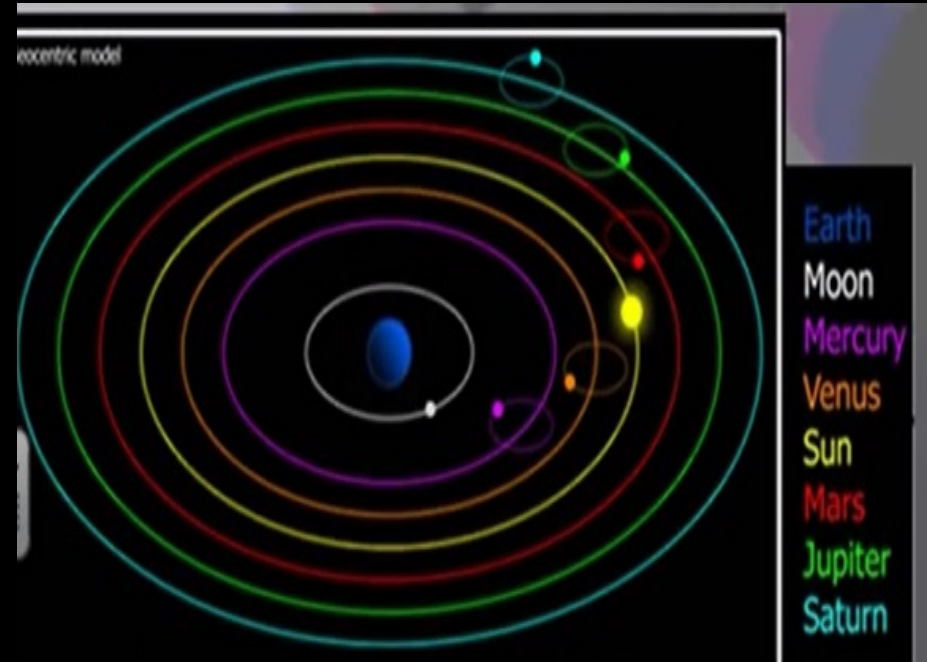
Aristotle



# What were the scientific thoughts in the Early 1500s?

## B. The Christianized Version of Aristotle

- “Natural Philosophy was based primarily on the ideas of Aristotle, and the Christianized version of Aristotle:
- A **motionless earth** stood at the center of the universe and was **encompassed by 10 separate concentric crystal spheres** in which embedded the moon, sun, planets, and stars.
- Beyond the spheres was **Heaven** with the **throne of God** and the souls of the saved.
- **Angels kept the spheres moving in perfect circles.”**



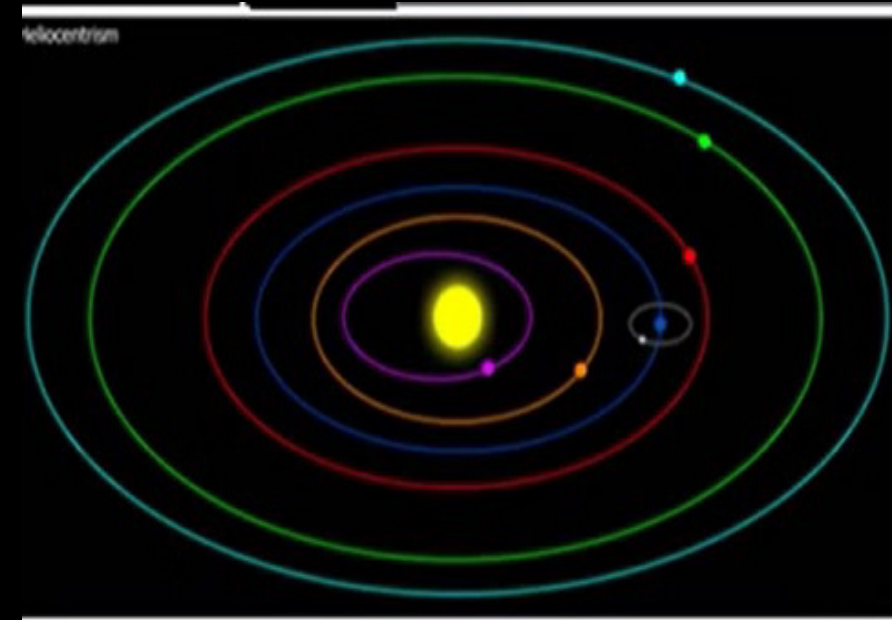
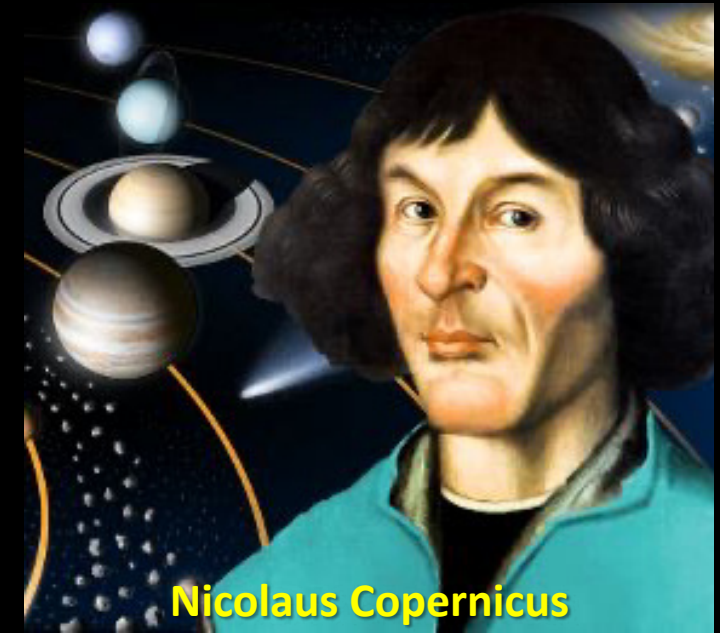


# What were the scientific thoughts in the Early 1500s?

## C. Copernican Hypothesis of The Heliocentrism

### Nicolaus Copernicus 1473 - 1543

- Studied astronomy, medicine, and church laws at the University of Kraków, **Poland**.
- Copernicus developed the argument that the **sun** and not the earth was the **center** of the universe.
- This argument was identified as the **Copernican Hypothesis**.
- “He theorized that the stars and planets, including Earth, revolved around a fixed sun.”
- Both **Protestant** and **Catholic** Church leaders condemned the hypothesis, arguing that it **conflicted** with biblical scriptures.





## D. Proving Copernicus is Right

### 1. Johannes Kepler 1571 - 1630

- Kepler was able to prove the Copernican Hypothesis mathematically.

#### Kepler 3 new notion:

1. He demonstrated that the orbits of the planets are **elliptical**, not **circular**.
2. The planets **do not** move at a **uniform speed** in their orbits.
3. When a planet is **close to the sun**, it moves faster than it is far from the sun.
4. The time a planet takes to make its complete orbit is precisely related to its distance from the sun.



Johannes Kepler

## 6 The Universe Johannes Kepler

<https://www.youtube.com/watch?v=a19LTnXkyVQ>



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HISTORY.COM

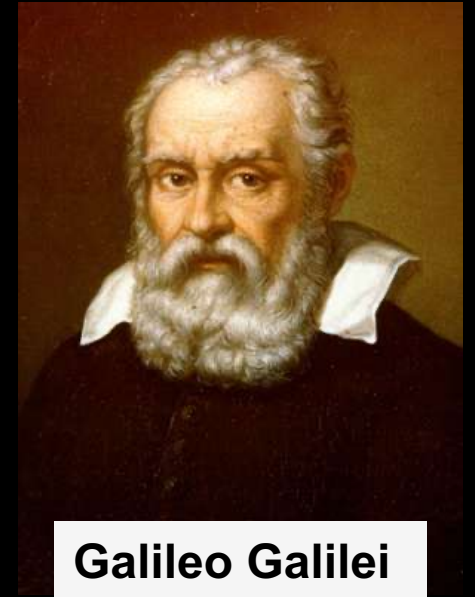
## D. Proving Copernicus Right

### 2. Galileo Galilei 1564-1642

- A young Florentine worked on the elaboration and consolidation of the experimental method.

### 3. Galileo's Law of Inertia

- He argued that motion, not rest, is the natural state of objects.
- Objects are continuously in motion until stopped by an external force.



Galileo Galilei



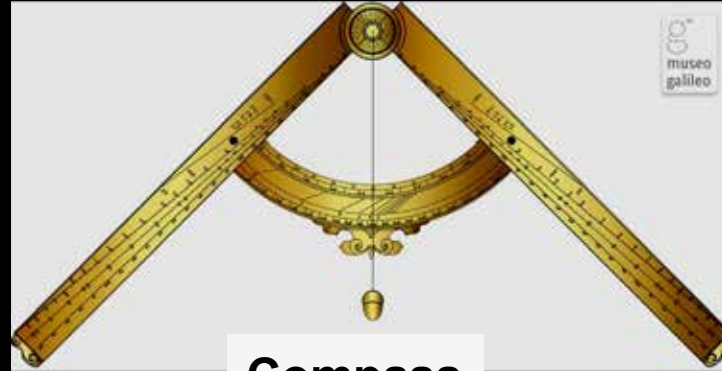
# 7 The Universe Galileo Galilei

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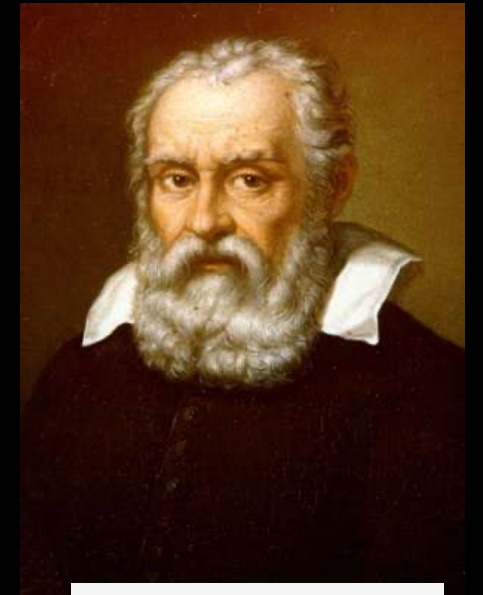


# Galileo's Inventions

1. Thermometer 1593
2. Compass 1597
3. Telescope 1609
4. Pendulum Clock 1641



Compass



Galileo Galilei



Thermometer



Telescope



Pendulum Clock

# E. Newton's Synthesis

## □ Isaac Newton 1642-1727

- English studies at Cambridge Uni.
- He was Mathematician and Physicist.
- 1661, he **accepted** the **Copernican hypothesis**,
- but he wanted to know what forces controlled the **planets' movements**.
- His book The **"Principia."**
- **"Mathematical principals of natural philosophy"**.
- He developed the argument that all objects are **attracted** to **each other**.
- He made crucial discoveries in optics and the science of light.
- Newton's **contributions** to **mathematics**, **astronomy**, and **physics** were truly enormous.



Isaac Newton





# E. Newton's Synthesis



Isaac Newton

Isaac Newton



[Isaac Newton and a Scientific Revolution](#)

## F. Bacon, Descartes, and the Scientific Method

### □ Francis Bacon (1561-1626)

- An English politician and writer was great at the experimental method.
- He promoted a rational approach to science based on reasoning through observation and experimentation rather than through speculative reasoning. **(Empiricism)**
- He emphasized the concept of Inductive reasoning.
- Inductive reasoning is a logical process in which multiple premises, all believed true or found true most of the time, are combined to obtain a specific conclusion.
  - Which is a theory that all knowledge originates in experience.



Francis Bacon

# The Deductive and Inductive Reasoning

## □ Deductive/ Aristotle:

- Using logic or reason to form a conclusion or opinion about something
- Deductive reasoning is Certainty (always true)

## □ Inductive/ Francis Bacon:

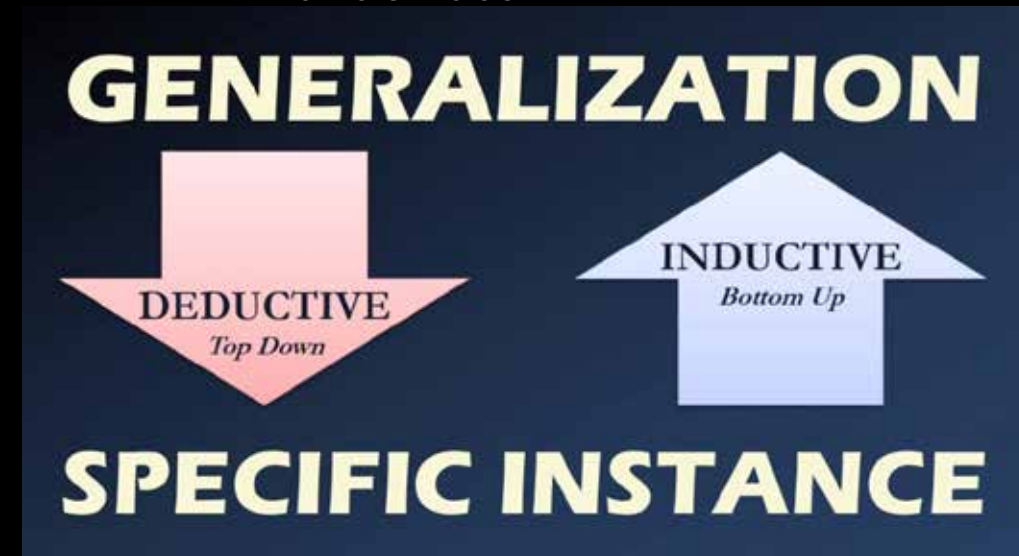
- Using a particular example to reach a general conclusion about something.
- Inductive reasoning is a Probability – (may be true)



Francis Bacon



Aristotle



## F. Bacon, Descartes, and the Scientific Method

□ **René Descartes** (1596-1650) French philosopher

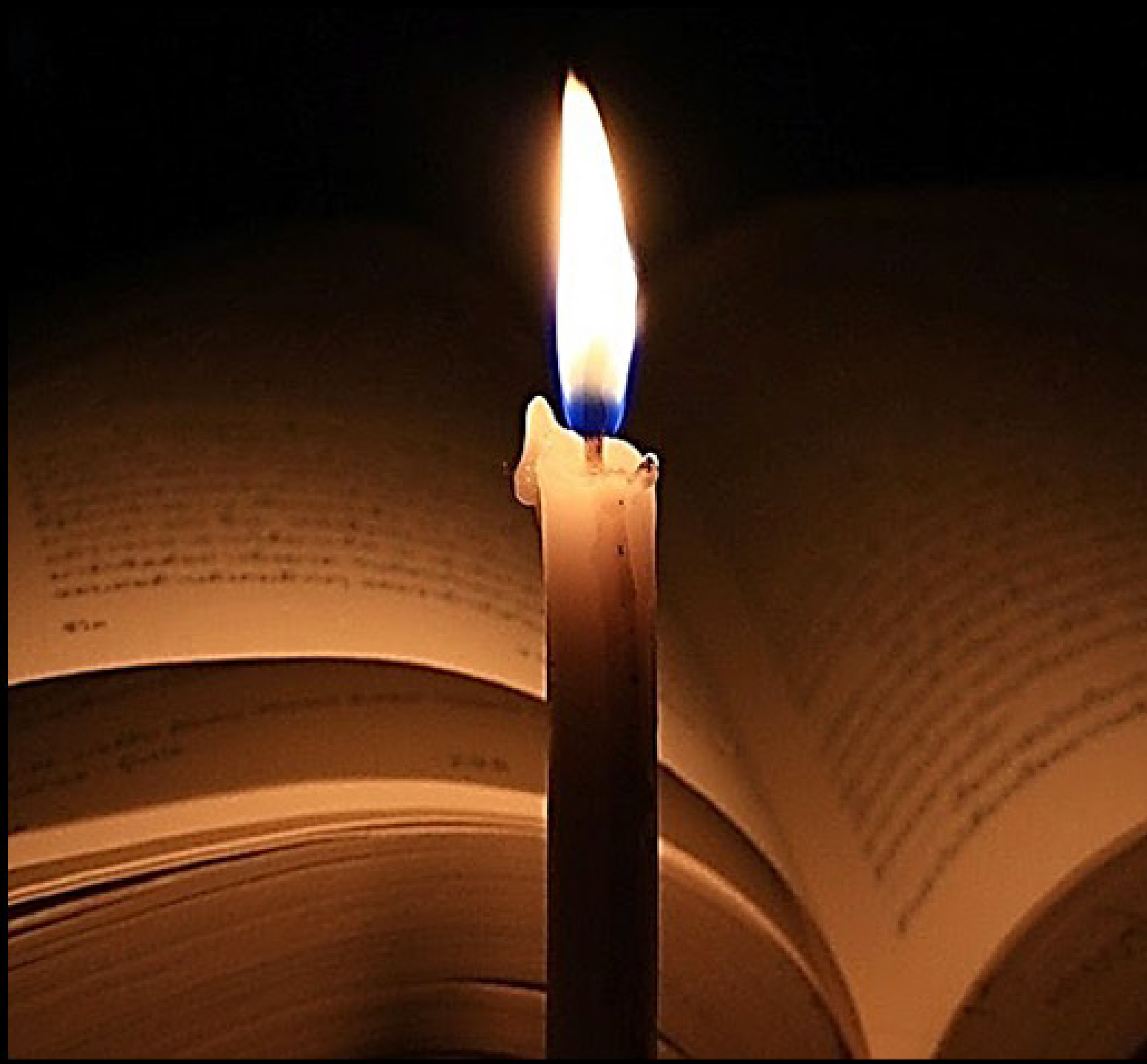
- Cartesian dualism promoted that the world consists of two fundamental entities: **matter** and **mind**, i.e., the **physical** and the **spiritual**.
- He symbolized the universe like a perfect clock that has been designed and built by a master Clock Maker, that is, God All-Powerful!
- A God that had set the universe into motion and then left it alone.
  - **I think, therefore, I am!**



Descartes

# The Age of Enlightenment

What is the Age of Enlightenment?



# What is the Age of Enlightenment?

- The Enlightenment was an **intellectual, Philosophical**, and **cultural** movement in the late 17<sup>th</sup> & 18<sup>th</sup> – cent. in Europe.
- It used **rational** and **critical** thinking to debate, such as **political sovereignty**, **religious tolerance**, gender roles, and racial difference.
- The Enlightenment Philosophes were reacted to the Middle Ages religious philosophy, which called **scholasticism**.
- The new ideas of the Enlightenment replaced the theological and religious doctrine.
- The ideas of the Enlightenment were considered **radical** in the 18<sup>th</sup> cent. and caused significant **agitation** in society.
- So, what were these ideas that created such a fuss and changed history forever?



# What were these ideas that created such a fuss and changed history forever?

## □ The New Ideas were built on Humanism.

- ✓ Pleasure
- ✓ Happiness
- ✓ Anti-Discrimination
- ✓ Religious Tolerance
- ✓ Separation of Church and State

**Age of Enlightenment: The Age of Reason Explained - 11 min**

[https://www.youtube.com/watch?v=1Ef0erm\\_KQI](https://www.youtube.com/watch?v=1Ef0erm_KQI)



# How did the philosophes influence the Age of Enlightenment?





# The Influences of the Philosophes

- The Philosophes were a group of **influential intellectuals** who proudly proclaimed that they were bringing the **light of knowledge** to their ignorant fellow **creatures**.
- The philosophes wrote **novels** and **plays, histories** and **philosophies**, and **encyclopedias** to get to the public.
- Many philosophes used **satire** and **double meanings** in their written works to avoid censorship of their message.



# The Influence of the Philosophes

## □ John Locke (1632-1704)

- An English philosopher focused on **Political** subjects.
- He believed that the **power of a government** comes from the **consent** of the **governed**, which means the people should be able to choose who to govern them.
- He promoted the idea that every **human being** was **born** with **three natural rights**:
  - 1- Life
  - 2- Liberty
  - 3- The ownership of property

**John Locke, Natural Rights- NBC – 3 min**

<https://www.youtube.com/watch?v=T7-Abmn9IZY>

**POLITICAL THEORY - John Locke – 9 min**

<https://www.youtube.com/watch?v=bZiWZJgJT7I>



**John Locke**

# The Influence of the Philosophes

## □ John Locke (1632-1704)

- He also promoted the freedom of **the Press**, **Education Reform**, and **Religious Tolerance**.
- Locke believed in the concept of **Tabula Rasa**, which means "blank slate" in Latin.
- According to Locke, the human mind is empty at birth, and **knowledge and beliefs** are acquired through **experience** and **interactions** with the **environment**.
- This idea emphasizes the role of **external forces**, such as **education** and **social institutions**, in shaping an individual's **understanding** and **beliefs**.



John Locke

# Montesquieu (1689-1755)

- He was a French political philosopher who contributed to the development of modern democratic principles.
- Montesquieu's most significant contribution was his theory of the separation of powers.
- He advocated for a government divided into three branches: the legislative, the executive, and the judicial.
- He believed that dividing the powers of government would prevent the concentration of power and protect individual liberties.
- Montesquieu's ideas on the separation of powers greatly influenced the drafting of the United States Constitution and continue to be a fundamental aspect of modern democratic systems worldwide.



Montesquieu

# Montesquieu (1689-1755)

- He wrote a novel, "**Persian Letters**," which consists of fictional letters exchanged between two Persian travelers as they journey through **France**.
- Through their correspondence, Montesquieu provides a satirical critique of **French & European societies, politics, and religious institutions**.
- The "**Persian Letters**" is considered an essential work in the development of the **Enlightenment**.



Montesquieu

# Voltaire (1694-1778) François-Marie Arouet

- **Voltaire** was a French Enlightenment writer, philosopher, and historian.
- He was a strong advocate for freedom of speech, freedom of religion, and the separation of church and state.
- He was also a fierce critic of religious dogma, intolerance, and superstition.
- He wrote many works supporting England and scientific progress. He also was an advocate of religious tolerance.
- **Voltaire** was a reformer, not a revolutionary.
- He did not believe in social and economic equality.
- **Voltaire's** philosophical and religious positions were much more radical.



Voltaire

# Voltaire (1694-1778)

- He believed in God, but he rejected Catholicism in favor of **Deism**, belief in a distant, noninterventionist deity.
- He envisioned a universe in which God acted like a great **clockmaker** who built an orderly system and then stepped aside and let it run.
- **Voltaire** and most of the philosophes hated religious intolerance, which led to fanaticism and cruelty.
- His witty and **satirical writing** style made him both popular and controversial during his lifetime.
- His contributions to the intellectual significantly influenced the development of modern Western thought and the **principles of democratic societies**.



Voltaire

# Voltaire (1694-1778)

- He was imprisoned at the Bastille for offending the French.
- Went into exile in England
- Published work:
  - ✓ 1733 –*Letters Concerning the English Nation*– praised the British for their freedoms, especially of religion, and criticized the French.
  - ✓ 1759 – "*Candide*," a satirical novella that critiques the themes such as suffering, human nature, and the corruption of power.
- He supported the idea of **Freedom of Speech** with his famous statement:  
*"I disapprove of what you say but will defend to death your right to say it."*

**Voltaire**



**Voltaire**



# And many more!

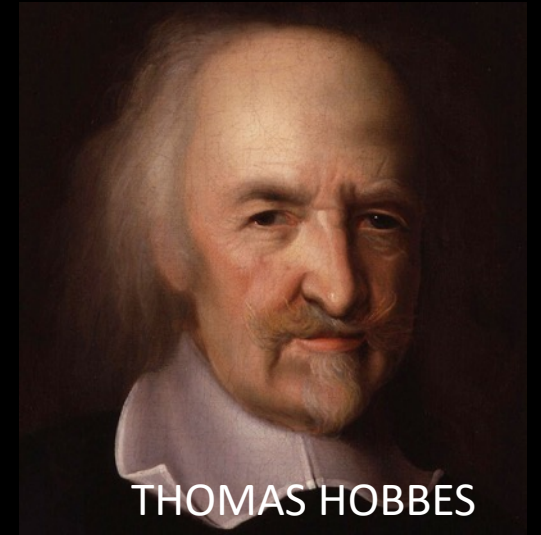
- ✓ IMMANUEL KANT (1724–1804)
- ✓ THOMAS HOBBS (1588–1679)
- ✓ JEAN-JACQUES ROUSSEAU (1712–1778)
- ✓ THOMAS JEFFERSON
- ✓ ADAM SMITH
- ✓ Etc...!



IMMANUEL KANT



JEAN-JACQUES ROUSSEAU



THOMAS HOBBS

Good Luck!

