

The Scientific Revolution and Enlightenment

Essential Question: Explain the causes and effects of the Scientific Revolution and Enlightenment.

___ I can analyze how the Scientific Revolution and the Enlightenment contributed to the transformations in European society. (HSCE 5.3.5).

___ I can explain how the ideas resulting from the Scientific Revolution and Enlightenment ultimately led to the French Revolution. (HSCE 6.1.1)

<p>Dawn of Modern Science</p>	<p>The Old View</p> <ul style="list-style-type: none"> -Seek answers about the natural world from the church and ancients -God placed earth at center of the universe with sun, moon and planets revolving around it (geocentric theory) -Confirmed by Aristotle <p>The New View</p> <ul style="list-style-type: none"> -Crusades led to contact with Arabs who had maintained scientific advancements during the Dark Ages -European scholars built upon Arab ideas; posed and tested theories leading to the Scientific Revolution -Exploration/navigation created need to understand & study new world -Old and new did not match <p>The Scientific Method</p> <ul style="list-style-type: none"> -State problem, hypothesis, experiment, record, analysis -Francis Bacon, England 1620, gain knowledge through method -Rene Descartes, France, math and logic, doubt until proven
<p>Discoveries in Astronomy, Math, Physics, Biology, Chemistry</p>	<p>Copernicus (Polish)</p> <ul style="list-style-type: none"> -Developed a formula proving the earth's rotation around the sun -Model of the solar system -Published theory last year of his life due to church and fear of ridicule <p>Brahe (Danish) and Kepler (German assistant)</p> <ul style="list-style-type: none"> -Distant exploding stars or supernova -Planetary movement around the sun in an oval or ellipse, not a circle -Mathematical model of the solar system <p>Galileo (Italian)</p> <ul style="list-style-type: none"> -1609 turned sailors' spyglass into a telescope -Saturn, craters on the moon, Milky Way made up of stars <p>Sir Isaac Newton (English)</p> <ul style="list-style-type: none"> -Law of gravity affects all objects in the universe/ keeps planets in orbits

	<ul style="list-style-type: none"> -Calculus used to predict effects of gravity -German accused Newton of plagiarism <p>Biology</p> <ul style="list-style-type: none"> -Greek physician compared humans to animals, never dissected -Bodies became available and advancements made with heart, circulatory system, saw blood cells with microscope <p>Chemistry</p> <ul style="list-style-type: none"> -Element described as tiny particles (atoms or molecules) -Changes in matter occur when molecules rearrange -Temperature, volume, and pressure affect gases -Matter can not be created or destroyed -Oxygen, metric system, Periodic Table w/33 elements
Effects of Discoveries	<p>The Church</p> <ul style="list-style-type: none"> -Main source of knowledge -Scientists were Christian -Facts and reasoning verses faith caused conflict -Galileo stood trial before an inquisition and put under house arrest -Eventually church came to accept findings <p>Art</p> <ul style="list-style-type: none"> -Anatomy learned to paint the body -Chemistry of paints and the nature of light -Math for balance -Math and physics for engineering buildings
The Age of Reason	<ul style="list-style-type: none"> -Reason used to solve all human problems (Political, economic, and social) and establish truth -The Enlightenment inspired educated Europeans -Gathered at coffeehouses to debate -Writers publish new ideas inexpensively to reach many -Peaked in 1700s in Paris -Salons or social gatherings hosted by women to discuss philosophy, art, science, etc. -Use thought to improve society
Thinkers	<p>Thomas Hobbes (English)</p> <ul style="list-style-type: none"> -English Civil War testimony to human greed and selfishness -People need government or absolute rulers (Leviathans) to bring order, peace, security in exchange for freedoms = Social Contract

John Locke (English)

- People are happy, tolerant and reasonable
- Born with natural rights of life, liberty and property
- Purpose of government is to protect rights, or be overthrown
- Government chosen by people not God
- Inspired revolutions

Jean-Jacques Rousseau (French)

- People are born good and corrupted by society
- Government is for the benefit of the people, Social Contract,
- Despised inequality

Baron de Montesquieu (French)

- Separation of powers or branches of government to prevent corruption and abuse of power, use checks and balances
- English system of parliament making laws, king carrying out laws and the court interpreting the laws (not exactly)

“Voltaire” or Francois-Marie Arouet (French)

- Philosophes
- Attacked injustice (nobility, government, church) and fought for toleration and liberty
- Imprisoned twice and exiled to England
- Candide*

Diderot (French)

- Encyclopedia
- 28 volumes detailing/criticizing art, science, government, religion
- Promotion of knowledge
- Took 27 years to complete
- Published in secret, spread Enlightenment ideas

Mary Wollstonecraft (English)

- Most were not enlightened regarding the role of women
- Women should be taught to be wives and mothers
- Rejected in *Vindication of the Rights of Women* 1792
- If women could be equally educated, they would be equal in society

Adam Smith (Scottish)

- Reason to analyze economics
- The Wealth of Nations* promoted a free market or “laissez-faire” economy

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<p>Spread of the Enlightenment</p>	<p>Enlightened monarchs or despots continued to rule Europe</p> <p>Prussia</p> <ul style="list-style-type: none"> -Frederick II attempting to rebuild Prussia into a military power -Started schools, abolished torture, religious toleration (except Jews), reduced censorship -Made reforms to become popular, and have more power <p>Russia</p> <ul style="list-style-type: none"> -Catherine II drafted a constitution and code of laws -Wanted to free the serfs but knew the wealthy landowners would object -Ended up imposing more serfdom than before and ruling absolutely <p>Austria</p> <ul style="list-style-type: none"> -Joseph II, son of Maria-Theresa -Eliminated death penalty, torture, free food, medicine, abolished serfdom, paid laborers, religious tolerance -Nobility and church forced him to revoke some reforms
<p>Legacy</p>	<ul style="list-style-type: none"> -Questioned ideas accepted as truths -Challenged church and government -Debated roles and rights of citizens -Belief in progress -Reason could solve problems and improve society -Ideas of power and authority cause revolutions

Summary: