

Enlightenment and Revolution, 1550–1789

Enlightenment scientists and thinkers produce revolutions in science, the arts, government, and religion. New ideas lead to the American Revolution.



Nicolaus Copernicus, 1543



Centers of Enlightenment, c. 1740



The Spread of Enlightenment Ideas



The Spread of Enlightenment Ideas

Foundations of the Enlightenment

BACON and DESCARTES:
Reason and Logic

ISAAC NEWTON:
Natural Law

HOBBS and ROUSSEAU:
The Social Contract

JOHN LOCKE:
Natural Rights—Life, Liberty, and Property

VOLTAIRE:
Religious Tolerance

MONTESQUIEU:
Separation of Powers

BECCARIA:
Reform of Criminal Justice System

ENLIGHTENMENT THOUGHT

Impact of the Enlightenment

Growth of Secular Ideas;
Importance of Education

Belief in Progress

American and French Revolutions,
Independence Movements

Declaration of Independence; Rights of Man
and Citizen; Growth of Individualism

U.S. Bill of Rights and
Enlightened Monarchies

French, U.S., and Latin
American Constitutions

Abolishment of Torture and
Capital Punishment

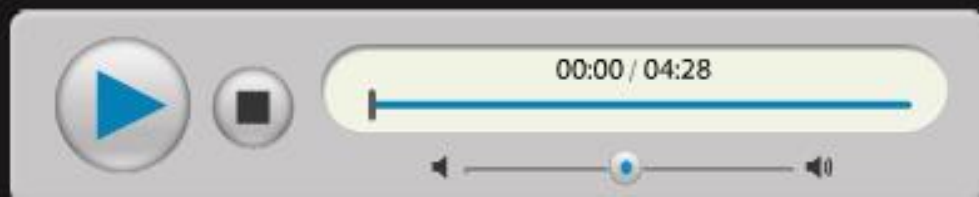
Voices From the Past

Mozart: A Genius for Making Music

One of the greatest composers who ever lived, Mozart began his career as a child prodigy performing for European aristocracy.



Wolfgang Amadeus Mozart, composer. Portrait (18th century).



Section 1

The Scientific Revolution

In the mid-1500s, scientists begin to question accepted beliefs and make new theories based on experimentation.

The Roots of Modern Science

The Medieval View

- Most knowledge in Middle Ages comes from Bible, Greek/Roman sources
- Supports **geocentric theory**—moon, sun, planets revolve around earth

A New Way of Thinking

- Renaissance prompts new ways of thinking (1300–1600)
- **Scientific Revolution**—new way of viewing natural world—based on observation, inquiry
- New discoveries, overseas exploration open up thinking
- Scholars make new developments in astronomy, mathematics

A Revolutionary Model of the Universe

The Heliocentric Theory

- Widely accepted geocentric theory challenged as inaccurate
- Copernicus develops **heliocentric theory**—planets revolve around sun
- Later scientists mathematically prove Copernicus to be correct

Galileo's Discoveries


- Italian scientist **Galileo Galilei** makes key advances in astronomy
 - makes discovery about planet surfaces, supports heliocentric theory

A Revolutionary Model of the Universe

Conflict with the Church

- Church attacks Galileo's work, fears it will weaken people's faith *[Visual]*
- Pope forces Galileo to declare his and other new findings are wrong



 Galileo at trial before the Inquisition in 1633. Painting, 17th century.

The Scientific Method

A Logical Approach

- Revolution in thinking leads to development of **scientific method**
 - series of steps for forming, testing scientific theories

Bacon and Descartes

- Thinkers Bacon and Descartes help to create scientific method
- Bacon urges scientists to experiment before drawing conclusions
- Descartes advocates using logic, math to reason out basic truths

Newton Explains the Law of Gravity

Newton's Theories

- English scientist **Isaac Newton** develops theory of motion
 - states same forces rule motion of planets, matter in space, earth
- Motion in space, earth linked by the law of universal gravitation
 - holds that every object in universe attracts every other object
- Newton views universe as a vast, perfect mechanical clock

The Scientific Revolution Spreads


Scientific Instruments

- Scientists develop microscope, barometer, thermometer
- New instruments lead to better observations, new discoveries

Medicine and the Human Body

- Andreas Vesalius improves knowledge of anatomy *[Visual]*
- Edward Jenner produces world's first vaccination—for smallpox



 Dura mater—the membrane surrounding brain. Anatomical drawing by Andreas Vesalius (1543).

The Scientific Revolution Spreads

Discoveries in Chemistry

- Robert Boyle argues that matter is made of many different particles
- Boyle's law reveals interaction of volume, temperature, gas pressure

Thank you for your attention!