

The Scientific Revolution

(1500s-1700s)



What was the Scientific Revolution?

- Beginning of modern science
- Scientific method: Depends upon logic, observation, and reason rather than faith
- Created the technologies and techniques that built the modern world
- Created paradigm of our solar system

Revolution in Epistemology and Philosophy

- Universities formed
- Rediscovery of classical science
- Leading figures
 - Bacon
 - Brahe
 - Copernicus
 - Descartes
 - Galileo
 - Kepler
 - Newton

Nicolaus Copernicus (1473-1543)

- Earth revolves around the sun
- Book *On the Revolutions of the Heavenly Spheres*
- Heliocentric theory:
 - Sun is the center of the universe

Tycho Brahe (1546-1601)

- Danish royal astrologer
- Follower of Ptolemaic system
- Observed and mapped over 700 stars in a 20-year period

Sir Francis Bacon (1561-1626)

- Preferred inductive reasoning and facts over theory
- Invented the scientific method

Galileo Galilei (1564-1642)

- “I recant”
- Invented the telescope, pendulum clock, thermometer, water pump, and sector
- Discovered speed of acceleration for gravity



Johann Kepler (1571-1630)

- Brahe's student for 20 years
- Living during 30 years of war
- Loved the planets and made it his life's work to explain the motion of planets
- Invented Three Laws of Planetary Motion

Rene Descartes (1595-1650)

- Deductive logic
- Deduced the existence of God
- Invented Cartesian geometry (xy axis)
- “I think therefore I am”

Sir Isaac Newton (1642-1727)

- *The Principia*
- Tied up the loose ends of Kepler and Galileo
- Three Laws of Motion
- Defined gravity and its laws
- Invented optics and calculus

Rise of the Scientific Community

- Developed the modern scientific method
- Universe ordered according to natural laws
- Discovered that scientific laws can be discovered by human reason
- Took the role of a deity or god out of the study of the universe
- Mechanical views of the universe
- Deistic view of God

Review Questions

1. Describe the Scientific Revolution.
2. What astronomer, author of *On the Revolutions of the Heavenly Spheres*, believed that the earth revolves around the sun?
3. Who is credited with inventing the scientific method?
4. Who came up with the Three Laws of Planetary Motion?
5. What famous Italian astronomer was convicted of heresy by the Inquisition?
6. What English scientist defined gravity?