

SSWH13: Scientific Evolution Notes

Standard: SSWH13 The student will examine the intellectual, political, social, and economic factors that changed the world view of Europeans.

a. Explain the scientific contributions of Copernicus, Galileo, Kepler, and Newton and how these ideas changed the European world view.

- Nicolaus Copernicus (1500s)
 - Copernicus was a _____ and mathematician who founded the idea that the _____ rotated on its axis, and revolved around the _____
 - Popular belief was that the _____
 - Introduced the _____
 - It states that the _____, the _____, and other _____ revolved around the _____
 - Scholars and clergy rejected this idea because it contradicted their teachings.
 - Fearing ridicule, he did not publish his findings until 1543, the last year of his life.
 - Future scientists would build on the foundations he laid.
 - His book was entitled *On the Revolutions of the Heavenly Bodies*
- Galileo Galilei (1560s-1640s)
 - Galileo was an _____ who supported Copernicus' _____ ideas
 - Discovered four moons around _____ and that the Earth's moon's surface was _____
 - His ideas led to the development of the _____
 - Built his own _____ and used it to study the _____
 - Published a small book called the *Starry Messenger*
 - His teachings came into conflict with _____ teachings
 - He was summoned to appear before Pope Urban VIII
 - Under threat of torture he agreed that his findings were _____
 - He lived the rest of his life under _____
 - "The Universe is like a clock, with its parts all working together perfectly in ways that can be expressed mathematically. God is the creator of this orderly universe. He is the clockmaker that set everything in motion." –Galileo
- Johannes Kepler (1570s-1630s)
 - Kepler, _____, showed that the planets traveled in an _____ path around the sun instead of the widely believed _____ path
 - Ideas lead to the development of the _____
 - Concluded that _____ govern planetary motion
 - The _____ revolve around the sun in elliptical orbits instead of circles

- Showed that _____ basic ideas were true and could be proved by using _____
- Sir Isaac Newton (1640s-1720s)
 - Newton, _____, discovered the universal law of _____
 - His law stated that the same principles governed gravity on both the _____ and in the _____
 - Tried to prove that all _____ were equally affected by the same _____
 - He said the same force ruled the _____ of the planets and all matter on earth and in space
 - He came up with the _____
 - Every object in the universe _____ every other object
 - The degree of attraction depends on the _____ of the object and the _____ between them
 - Newton published his ideas in the *Mathematical Principles of Natural Philosophy*
- The Scientific Evolution
 - All of these discoveries went against the teachings of the _____
 - Many scientists of the time period were pressured by the Church not to _____
 - These early scientists laid the groundwork for the _____ where ideas were based on _____ and _____ and NOT on _____ or _____