

10 – The Scientific Revolution

AKS:

examine the intellectual, political, social and economic factors which changed the world view of Europeans (GPS) (SSWH_G2007-42)

Indicators of Achievement:

42a - explain the scientific contributions of Copernicus, Galileo, Kepler and Newton and how these ideas changed the European world view,

Background: The Renaissance ideas of curiosity and reliance on personal experience spread throughout Europe in the sixteenth and seventeenth centuries, creating a Scientific Revolution. Intellectuals during this time laid the groundwork for modern scientific theory by relying on observation and experimentation. They looked for observable, mechanical observations of how the world works and discounted the authority of earlier philosophies. This revolution had the following characteristics:

- Focus on scientific method: knowledge of the universe is gained by 1) observing the world with ones senses 2) developing conclusions and generalizations based on these observations
- Movement away from superstition and speculation about the laws of nature
- Less reliance on thinkers of the past such as Aristotle, Plato, and Ptolemy
- The order and logic of the universe is fully understandable by the human mind
- Natural rather than supernatural forces govern the universe

The Scientific Revolution
People and Accomplishments

<u>Person</u>	<u>Achievement</u>
➤ Copernicus	Heliocentric theory (states that the Earth revolves around the sun)
➤ Kepler	The three laws of planetary motion and the scientific method: 1). Problem or question 2). Hypothesis 3). Data collection 4). Analyzing and interpreting the data 5). Forming a conclusion
➤ Galileo	The law of the Pendulum and created the first telescope

➤ Andeas Versalius	Published on the Fabric of human Body which stated that a human body was different from an animals
➤ William Harvey	Said that the heart, not the liver circulates blood
➤ Zacharias Janssen	First microscope
➤ Leewenhoek	Used the microscope to observe bacteria and red blood cells
➤ Fahrenheit	Made a thermometer using mercury – freezing at 32 degrees and boiling at 212 degrees
➤ Celcius	Created a different scale showing freezing at 0 degrees and boiling at 100 degrees
➤ Torrecelli	Created the barometer which is used to measure atmospheric pressure and predict the weather
➤ Ptolemy	Geocentric theory (stated that the Earth was the center of the universe)

Effects of the Scientific Revolution:

- New instruments such as the microscope, telescope, barometer, thermometer
- New thoughts clashed with the doctrine of the Catholic Church (such as Galileo being put on trial for disproving the geocentric theory)
- Advancements in the field of medicine (heart as a pump, advanced studies in anatomy)
- Paved the way for new scientific thought and led to the enlightenment

Document Practice:

“If I have seen farther than others, it is because I have stood on the shoulders of giants.” ---Sir Isaac Newton, 1676

Explain if this statement could be true of most scientific accomplishments. Use you your prior knowledge about the scientific revolution to support your answer.