

Teacher: Sherry Tipps-Holder

Grade: 8

Subject: World History/ Lesson designed for inclusion in unit on Scientific Revolution

Essential Question: What were the major contributions/innovations of the who's who of modern science?

- Learning Objective:**
1. Students will identify and explain the contributions of great men of the Scientific Revolution. (H.6.8.9)-
Copernicus, Galileo, Newton, Bacon, and Kepler
 2. Students will map the countries central to the Scientific Revolution.

Activities

Opening:

1. **Bellringer Quote:** "I CAN easily conceive, most Holy Father, that as soon as some people learn that in this book which I have written concerning the revolutions of the heavenly bodies, I ascribe certain motions to the Earth, they will cry out at once that I and my theory should be rejected." -- Copernicus
(Instruct students to respond to the meaning of the quote on student lab sheet.)

2. Introduce Lesson Objectives

3. Introduce the names of the Who's Who of the Scientific Revolution on the Profile Sheets for this lab. Have the students read and identify basic information about each scientist on the chart provided. (Partners or small groups optional/scientists may also be assigned by groups for efficient use of time)

4. Discuss the information as a class (transparency key)

Assignments:

5. Assign the map to be completed for homework. The map key is to be designed by students and show all of the requested features.

6. The lab extension page should also be assigned for homework.

Materials Needed: Student Lab Sheet, Who's Who Profile Sheets-Individual or class set, Chart , Map of Europe, and Lab Extension Sheet) Transparency of Chart Key and Overhead projector/ optional

Evaluation: Student comprehension will be monitored though class discussion and completion of Who's Who chart.

Assessment: 1. Map and extension sheet will also be part of the daily lesson (informal) assessment.

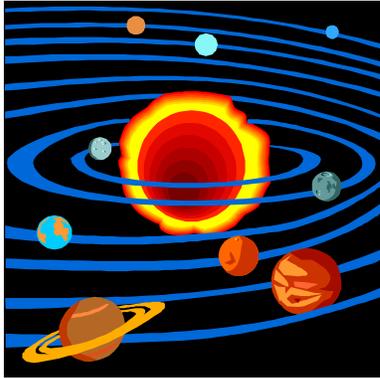
Assessment: 2. A summative exam will be given at the end of the unit and will (Formal) include an objective portion and open response portion.

Name _____ Date _____ Period _____

Scientific Revolution

Student Lab Sheet

I. Bellringer



“ I CAN easily conceive, most Holy Father, that as soon as some people learn that in this book which I have written concerning the revolutions of the heavenly bodies, I ascribe certain motions to the Earth, they will cry out at once that I and my theory should be rejected.” – Copernicus

******What do you think Copernicus was saying about his work and ideas?**

- Daily Objectives:**
- 1. The students will identify and explain the contributions of Great men of the Scientific Revolution.**
 - 2. Students will map places central to the Scientific Revolution.**

II. The Who’s Who of the Scientific Revolution (Using the Profile Sheet, use the chart to record information about the scientists. Be prepared to give answers to the class.)

III. Who’s Who Map Activity: Develop your own map key with COLORS to show places in Europe central to the Scientific Revolution. Label the following on your map.

Country of:

Nicholas Copernicus

Galileo Galilei

Johannes Kepler

Francis Bacon and Isaac Newton

***Africa**

Bodies of Water

Atlantic

Mediterranean Sea

Black Sea

North Sea

Baltic Sea

IV. Complete the Lab Extension Sheet 4/2

Who's Who? Men of the Scientific Revolution

Directions: Read the "Who's Who?" profile sheets and chart the information.

Scientist	Nationality/ Place of Birth	Field/Area of Science	Discovery/ Theory/Laws? Beliefs	Impact on Science and Society
Copernicus				
Galileo				
Kepler				
Bacon				
Newton				

Scientific Revolution: Who's Who Profile Sheet cont.



Francis Bacon (1561-1626) was an English philosopher, statesman, essayist, and defender of the Scientific Revolution. His works established and popularized an inductive method for scientists to use to explore things they did not fully understand. This method was called the “Baconian Method” or simply the *scientific method*. The scientific method is still used as a framework for scientific research today. He is credited with the establishment of the Royal Society of London, an organization for the advancement of scientific knowledge. Francis Bacon is also credited with the saying, “Knowledge is power”.

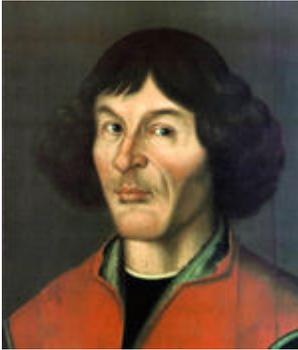


Isaac Newton (1642-1727) was an English physicist, mathematician, astronomer, and philosopher. He stated the three universal “laws of motion” that were not improved upon for more than two hundred years. He used the Latin word *gravitas* (weight) for the force that would become known as gravity, and defined the law of universal gravitation. This law was developed after watching an apple fall while in his orchard. In 1703, Newton became president of the Royal Society of London. He is considered one of history’s greatest scientists, ranking alongside such figures as Einstein and Gauss.

Newton’s calculations changed the way people understood the universe. No one had been able to explain why the planets stayed in their orbits.

What held them up? Less than 50 years before Isaac Newton was born it was thought that the planets were held in place by an invisible shield. Isaac proved that they were held in place by the sun’s gravity. He also showed that the force of gravity was affected by distance and by mass. He was not the first to understand that the orbit of a planet was not circular, but more elongated, like an oval. What he did was explain how it worked.

Who's Who of the Scientific Revolution Profile Sheet



Nicholas Copernicus (1473-1543) was a Polish astronomer, mathematician, and economist who developed the heliocentric (sun centered) theory of the solar system. His theory about the sun as the center of the solar system overturned the geocentric theory (Earth as the center of the solar system). This theory was the fundamental starting point for modern astronomy and modern science itself. His work affected many other aspects of human life as well, opening the door to young astronomers everywhere to challenge the facts and never take anything at face value.



Galileo Galilei (1564-1642) was a Tuscan (Italian) astronomer, philosopher, and physicist who was an important part of the Scientific Revolution. His achievements include improving the telescope, making important astronomical observations, and making the first law of motion. He fully supported the teachings of Copernicus. He is often called the “father of modern astronomy”, the “father of modern physics”, and the “father of science”. Because of his beliefs, he was branded a heretic by the Roman Catholic Church and imprisoned for life.



Johannes Kepler (1571-1630) was born in southwest Germany. He became a professor of mathematics at a Protestant seminary in Austria where he pursued the study of astronomy and astrology. In 1609 his work called the *Astronomia Nova* (“New Astronomy”) appeared containing three laws of planetary motion. One of these states that the planets move in elliptical orbits with the Sun at one focus. Another law stated that planets sweep out equal areas in equal times. In 1610, he heard about Galileo’s discoveries with the spyglass and wrote letters (tracts) which were an enormous support to Galileo, whose discoveries were doubted and denied by the Catholic Church. Kepler also suffered persecution at the hands of the Church. Kepler is considered to be the “founder of physical astronomy”.