The Scientific Revolution

Enduring Understanding: The relationship between citizens and their government is a fundamental component of political rule. To understand the role of constitutions, the characteristics of shared powers, the protection of individual rights, and the promotion of the common good by government, you will be able to explain how the Scientific Revolution challenged authority and influenced Enlightenment philosophers, including the importance of the use of reason, the challenges to the Catholic Church, and the contributions of Galileo and Isaac Newton.
The **Scientific Revolution** emerged out of the advancements made in the areas of science and math in the late 1500s and early 1600s. Following the age of exploration, new truths and new research challenged previous thought processes and studies. As evidence mounted, scientists began to question ancient theories and teachings of the Roman Catholic Church. These scientists began using reason and logical thinking instead of placing their beliefs in faith. They demanded proof or evidence.

**Section Review:**
1) What did scientists begin to question during the Scientific Revolution?

2) What type of thinking did scientists begin using during the Scientific Revolution?

3) What did scientists begin demanding during the Scientific Revolution?

Claudius Ptolemy was an old world thinker before the Scientific Revolution. His belief of planetary motion was the **geocentric theory**, which taught that Earth was at the center of the universe and everything revolved around Earth. The Roman Catholic Church agreed with and taught this theory. Nicolaus Copernicus questioned Ptolemy and the Church. He suggested a **heliocentric theory**, which means that the sun is the center of the solar system and everything revolved around the sun. Galileo Galilei improved upon the telescope and used it to prove Copernicus’ heliocentric theory.

Isaac Newton’s laws of gravity furthered Galileo’s laws of motion and continued to challenge the old church theories. With his law of **universal gravitation**, Sir Isaac Newton described **gravity** as the mutual attraction between any two bodies in the universe.

The **scientific method** was a major contribution of this time period, establishing a systematic way to find proof using reason. The scientific method is still used today to test theories and hypotheses. The scientific method is the logical procedure for testing theories that includes beginning with a question, forming a **hypothesis** (an assumption or guess), testing through experimentation, and finally analyzing data to reach a conclusion.

**Section Review:**
4) How do the geocentric and heliocentric theories differ?

5) Which theory did the church support and teach?

6) Who developed the heliocentric theory?

7) Who discovered gravity?
A significant conflict arose between scientific thought and traditional religious beliefs during this time. The Bible, as interpreted by the Roman Catholic Church, served as authority in all parts of life for society prior to the rise of science. The teachings of the church were based on faith and revelation. The Church felt threatened by science because it offered evidence for its theories. With the publication of these new theories, the teachings of the Bible and the church were called into question. This was a challenge to faith by reason.

For the church, political, social, and economic authority was on the line. Scientists like Galileo were called to renounce or stop their teachings and reaffirm the teachings of the church or face excommunication. If excommunicated a scientist would no longer be recognized by the church as a member and would not be able to take part in any church event.

Section Review:
8) Why was the Roman Catholic Church afraid of accepting new ideas and beliefs?

9) What punishment did the scientists face if they would not renounce their teachings?

After publishing his book in 1532, Galileo was charged with heresy, or anti-church teachings. He was put under house arrest by the church towards the end of his life because of his challenges.

All of these challenges to authority inspired the philosophers of the Enlightenment to then begin using reason to apply it to the political environment in Europe. Through the use of reason, Enlightenment philosophers began developing ideas that challenged the unlimited governments of the time and influenced the development of limited governments in the 1600s and 1700s.

Section Review:
10) What is heresy?

11) How were Enlightenment philosophers inspired by the scientists of the Scientific Revolution?
Bibliography


