The Scientific Revolution

What is a revolution? Sometimes, people automatically think of a war when they hear that term. And, yes, it is true that a revolution can have reference to a war such as the American Revolutionary War fought between the American colonists and the British. However, the word revolution also has the idea of something else. A revolution is ,"a radical and pervasive change in society and the social structure, especially one made suddenly… (taken from dictionary.com). A revolution involves a huge shift in how people view something that will bring change to that society. That is precisely what we are looking at with the Scientific Revolution!

The **Scientific Revolution** occurred from approximately 1550-1700 and led to a huge shift with how people in Europe viewed the world. Prior to this time, most people believed in a **geocentric** (earth-centered**)** view of the world. They believed that the earth was the center of the universe and that everything else in the cosmos, including the sun, revolved around it. This was from the ancient ideas of a Greek astronomer named **Ptolemy**. However, a groundbreaking book was published in 1543 that changed all of that and SHOOK the foundations of society.

In that year, a Polish astronomer named **Nicolaus Copernicus**' book *On the Revolutions of the Heavenly Spheres* was published. In this book, he stated the theory that the sun, rather than the earth, is at the center of the universe and that the earth (as well as other planets), revolve around the sun. This is known as a **heliocentric** (sun-centered) view of the universe.

In the early 17th century (1600's), the German astronomer **Johannes Kepler** computed that planets moving around the sun had **elliptical** (or oval-shaped) orbits rather than a perfect circle as had been believed. He also put forth other ideas concerning the motion of planets.

One of the biggest influences on this time period was an Italian named **Galileo**. His use of a telescope allowed him to **discover four moons orbiting Jupiter**, physical features on the moon, and sunspots. He also discovered that **objects would fall at the same rate of speed** even if one object had more weight than another. Because of his belief in heliocentric ideas, the Roman Catholic Church was very upset with him. The church had believed and taught that the earth was the center of the universe and this idea of a sun-centered universe upset their belief systems. Galileo was eventually brought to a trial by the church and under pressure of death did recant (or reject) his belief in a sun centered universe.

Sir Isaac Newton was a huge giant of the Scientific Revolution. He was a genius at math (he was one of the first people to use calculus so when you take Calc. I and Calc. II further on in high school and college, you can thank him ☺) He proved that **gravity was the force** that allowed planets to stay in their orbit around the sun as well as making sure that when an object goes up, it must come down. He also formulated **three very important laws of motion**, including the famous, "For every action, there is an equal and opposite reaction." (Therefore, if I release air from a full balloon, the balloon will fly upwards.) Newton's ideas remained the law until a very famous person came along and changed the way we view space and time. That person was **Albert Einstein** ☺

One of the very important ideas that came out of the Scientific Revolution was the use of the **scientific method** made popular by the English philosopher named **Francis Bacon**. When you work with science experiments this year or when you complete a science fair project, you will do the following: 1. Ask a question, 2. Research the question, 3. Form an hypothesis, 4. Test your hypothesis with an experiment, 5. Record and analyze your data, and 6. State a conclusion to your process and share your results.

All of these ideas of the Scientific Revolution were very revolutionary. Why? (Please write 2-3 sentences below of what you think and why.)