RS Notes: The Scientific Revolution

**How did thinking change?**

* Medieval scientists did not make observations
	+ Looked at the works of Aristotle for knowledge
* Renaissance thinkers studied newly discovered works of Ptolemy, Archimedes, and Plato
	+ Learned that some had disagreed with Aristotle
	+ Tried to reconcile the differences
* Technical problems, like determining how much a ship could carry spurred a movement towards observation and experimentation.
	+ New instruments, like telescope and microscope, will make these experiments possible
* They used mathematics to lead these experiments

**Astronomy**

* Born in 2nd Century AD, **Ptolemy** was antiquity’s greatest astronomer
	+ Ptolemaic system= **geocentric** model of the universe
		- Earth (motionless) is in the center
		- Planets are different crystal-like spheres
		- 10th sphere=**prime mover**
			* It moves, so everything inside its path moves
		- Beyond this, is Heaven
* **Nicholas Copernicus** believed in his heliocentric system
	+ Sun is in the center
	+ Planets revolve around the sun, the moon around the Earth, and Earth rotates on an axis
* **Johannes Kepler** helped to destroy the Ptolemaic system
	+ Observations confirmed the sun was the center
	+ Tracked elliptical orbits of the planets
		- Ptolemy said they were circles
* Englishman **Isaac Newton** responded to one of the questions for the new model of the universe: What explains motion in the universe?
	+ He defined 3 laws of motion
	+ Crucial to his view is the **universal law of gravitation**
		- Every object in the universe is attracted to every other object by a force called gravity
		- This explained why planetary bodies did not go off in a straight line, but traveled in elliptical orbits
	+ This dominated the worldview until Einstein’s Theory of Relativity
* **Galileo Galilei** answered the other question for the new astronomy: What are the planets made of?
	+ He made regular observations using a telescope
		- Saw mountains on the moon and moons orbiting Jupiter
	+ Ptolemy said they were made of light, but now it seems they are made of material

**Galileo vs. The Church**

* Galileo’s work began to make Europeans aware of the new view of the universe
	+ He got into trouble with the **Catholic Inquisition**
		- The Pope ordered him to abandon the new system
		- Copernican model contradicted that of the Church and the Bible
			* The heavens were not spiritual but material, and God was no longer in a specific place
			* Most astronomers, however, believed the new model was correct