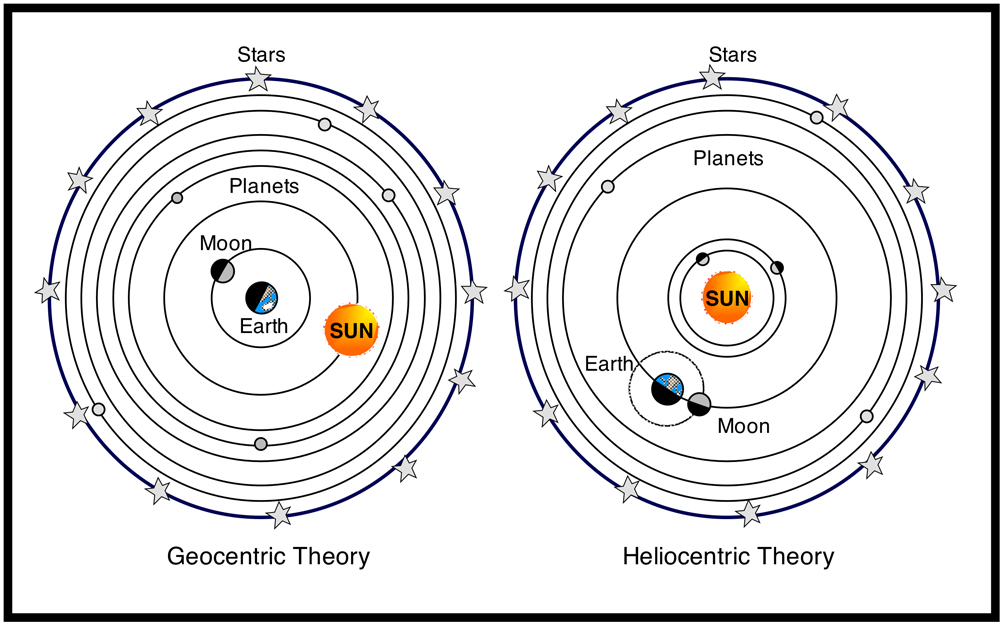
RS Notes: The Scientific Revolution

**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