Chapter 1
The Copernican Revolution

Aristotle

Aristotle Summary:
• Different laws for us on Earth vs. Objects in sky.
• Earth is at the center (geocentric)
• Sky objects are “perfect”
• Sky objects move in perfect circles at constant speeds

Ptolemy

Figure 1.2
Copernicus Summary:
• Sun at center - Earth is a planet
• Earth orbits sun once a year, and rotates on its axis once a day
• Couldn’t make it work – still used epicycles.

Related vocabulary words:
Heliocentric
Kepler Summary:

- Correctly determined the way the planets orbited the sun

3 laws:

1) Planets have elliptical orbits, Sun at one focus
2) The closer a planet is to the Sun, the faster it moves
3) Mathematical relationship between time to make one orbit, and average distance from Sun

An “Astronomical Unit” (AU) = the average distance between the Earth and Sun.
- (Today, we know it is approximately 93 millions miles).
Newton Summary 1:
- Much progress while laid-off from work:
  - Came up with 3 laws of motion
  - Discovered law of gravity
  - Invented Calculus
  - Discovered laws of optics
  - Invented Reflecting Telescope

Law of Gravity
1. Force between all objects with mass
2. The greater the masses, the greater the force
3. The farther apart the two objects are, the weaker the force
Newton Summary II:

- With Gravity, he showed that the same laws that applied on Earth also applied to objects in sky
- Among the first to express laws of nature mathematically
- Laws of motion plus law of gravity are the foundation of modern Physics

Chapter 2
Light and Matter