**Early Astronomy**

Babylonians

The earliest record of celestial observations comes from the Babylonians around 747 BC. The emphasis of this observation does not seem to be to explain the behavior of the celestial bodies, but rather to forecast astronomical appearances.

The desire to keep such accurate records may have been driven by

1. natural curiosity
2. need for control (development of a calader)
3. Religious observation.

The emphasis here was on When not Why.

The Babylonians contributed

* Continuity in their records
* And a reliable calendar by which to interpret these records.
* Degree measurement of a circle – form their numerical system. 360 degrees divided into 30 degree parts results in 12 sections, each containing a major constellation

Greek Philosophers

The Greek philosophers on the other hand emphasized the theory behind these astronomical behaviors.

**Thales**

One of the earliest Greek astronomers was Thales. He was born around 624 BC. Thales is considered to have been the first of the Greek philosophers to move away from supernatural explanations of the natural world. Thales said the earth floats on water and that all the different parts of the earth, from mountains to trees were also made of different states or forms of water.

**Plato**

The cosmos was a spinning top built out of 8 shells all turning independently on a centre shaft.

**Aristotle**

* Aristotle was born on 384 BC, was a star pupil in Plato’s Academy in Athens, and became the first person to develop a system to explain how the universe worked. Spheres that rotated around the Earth carried stars, planets and the sun. The earth was a spherical ball in the center of the spheres and was therefore the centre of the universe.
* Stars were located on the inside of the largest sphere that rotated once a day around the earth
* planets were located on smaller, transparent spheres that rotated at different speeds and on different axis. This could explain why planets seem to move inside the stars. The transparent spheres explain why we can see planets and stars.
* The universe is perfect. The circle is a perfect geometric shape. The planets and sun and all heavenly objects must move in circular paths around the earth.

**Aristarchus**

 Aristarchus was born on 310 BC. He was able to declare that the sun was a huge ball of fire and that the sun, planets and stars did not revolve around the Earth, but that the Earth and planets revolved around the Sun.

**Hipparchus**

Many consider Hipparchus the greatest of the Greek astronomers. He was able to:

* compile an extensive star chart using just his eyes. He included a classification of stars according to their brightness. His star chart was used for centuries.
* He calculated the distance to the moon using parallax.
* He discovered the existence of precession in which the axis of rotation of the Earth changes over time.
* Hipparchus developed a system of epicycles to help explain the movement of planets in a geocentric system.

**Ptolemy**

Ptolemy was born Claudius Ptolemaeus in 100 AD. He chose to side with Aristotle and describe a universe that was Earth centred. Ptolemy established a complex theory of **epicycles** or little circles to explain the **retrograde** motion of planets as seen from the earth. Ptolemy presented his picture of the universe as we know it in a book called the ***Almagest*** in which he summarized Greek knowledge up to that time.

**Pythagoreans**

Italy – 340 BC. Believed in the order of all things. Proposed that the Sun was the centre of the celestial sphere because “The worthiest place belongs to the worthiest occupant and Fire is worthier than Earth.

**Copernicus**

1473 -1543

Heliocentric

Earth does rotate- Motion is relative

Fought against inconsistent and unsystematic

Explained retrograde motion by placing the earth on a orbit whose centre was not the sun,

**Galileo**

Heliocentric

(1564-1642),

**Kepler, Johannes** (1571-1630),