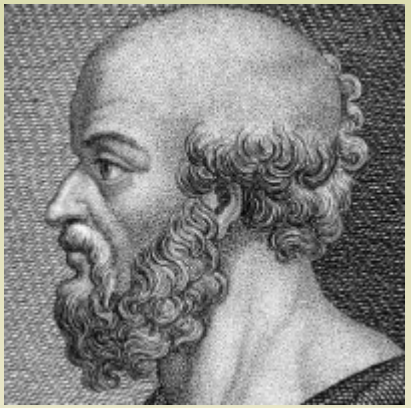
Eratosthenes of Cyrene

Ancient Greek librarian, geographer, mathematician, astronomer, historian, and poet

(276 – 194 BCE)

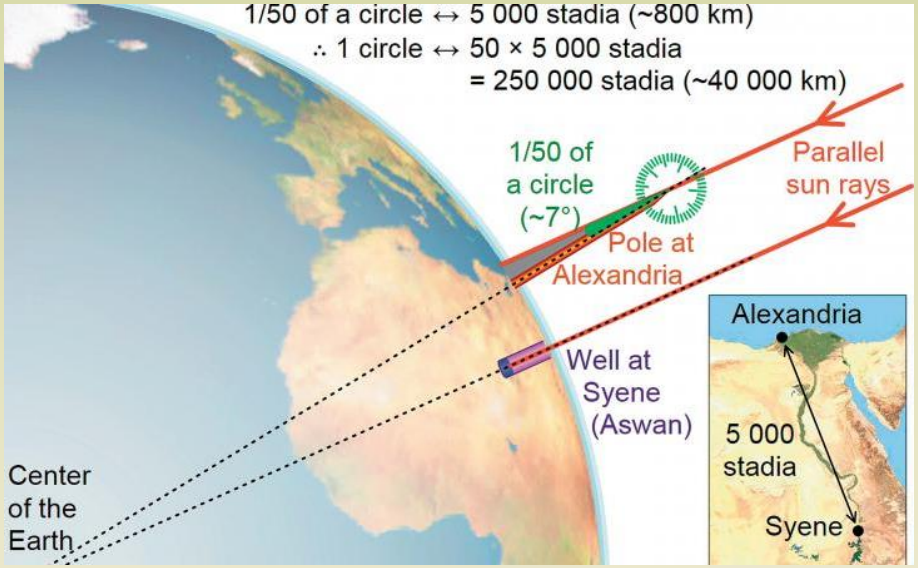


Eratosthenes was the first person to measure the size of the Earth with remarkable accuracy.

This was a moment of triumph for the human intellect:

- first recognize that our planet is a sphere,
- then use the powers of observation, deduction, and mathematics to calculate its size.

Measuring the Earth



On the day of Summer solstice Eratosthenes measured the angle of a shadow cast by a stick at noon in Alexandria. Sunlight fell at an angle of about 7.2°.

In Syene the Sun was directly overhead.

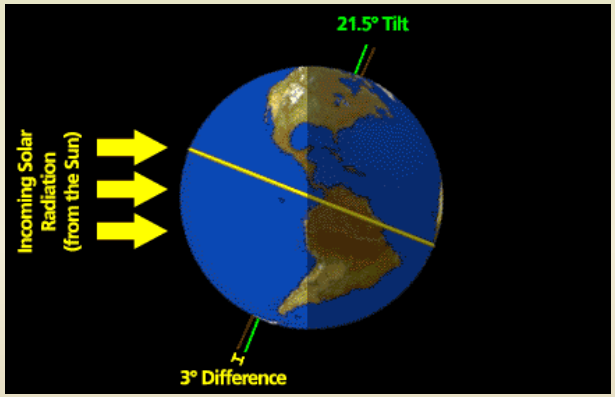
Since $7.2^{o}/360^{o}= 1/50$, Eratosthenes reasoned that the distance between Alexandria and Syene (790km) had to be 1/50 the circumference of the Earth.

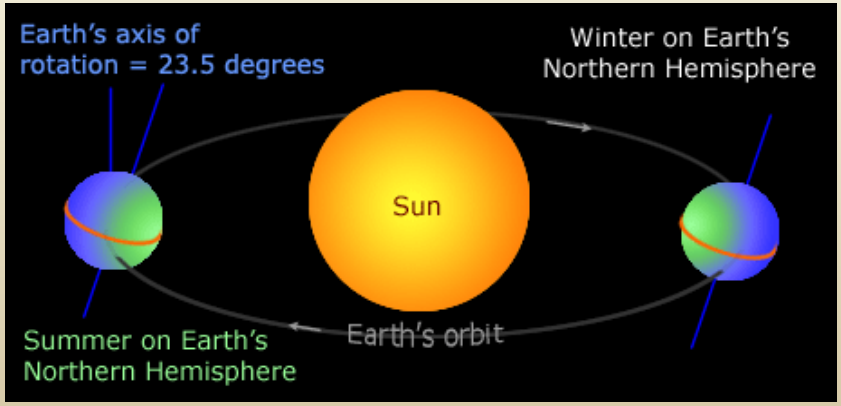
Thus he estimated the circumference of the Earth as 50x790 = 39500km, so the diameter of Earth is 39,500/π = 12580 km

This is very close to the modern value of 12756 km.

Eratosthenes achievements

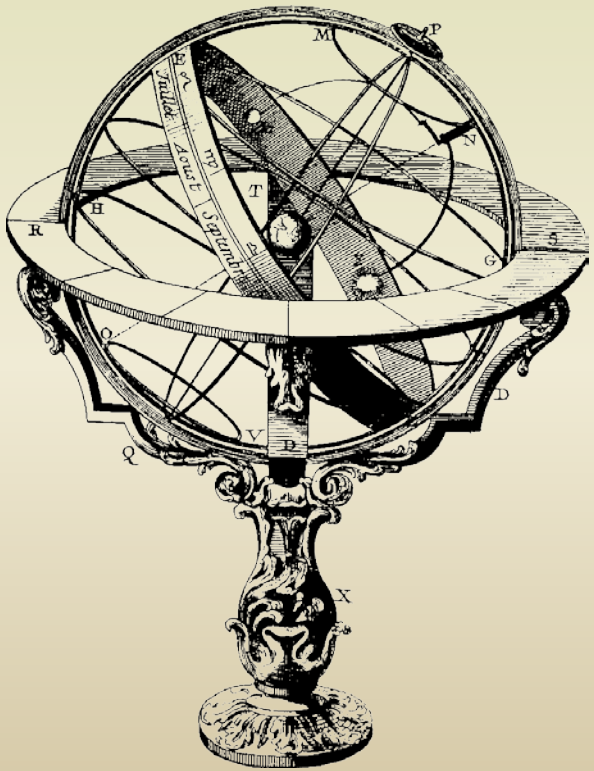
He measured the difference between noontime elevation of Sun in winter and summer and deduced that Earth's equator is tilted by 23.5 degrees, which gives us the seasons.





Eratosthenes achievements

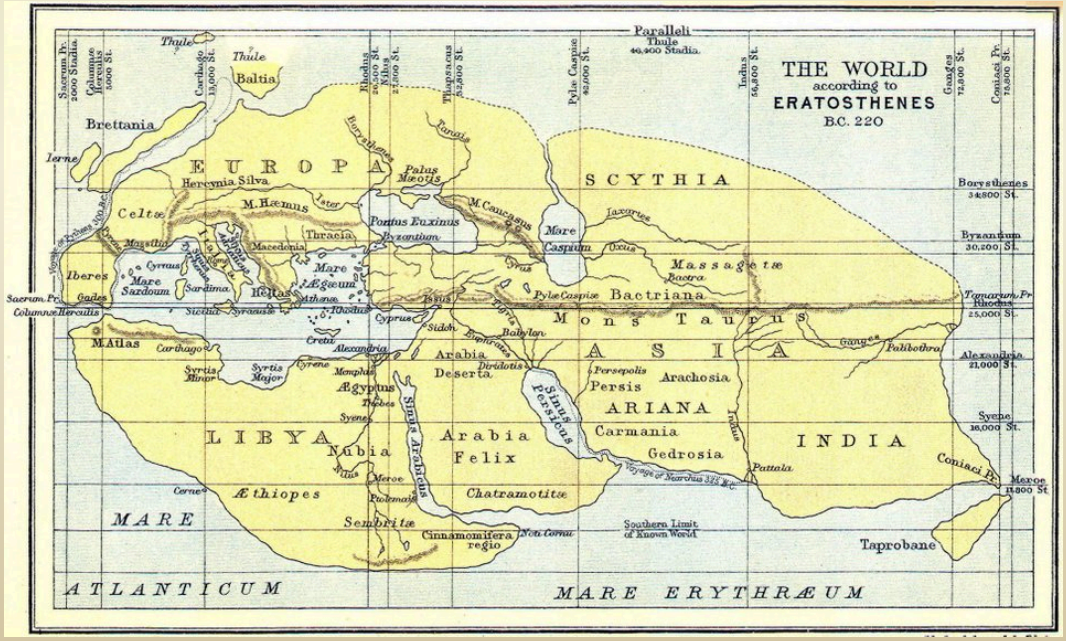
He invented the armillary sphere, for 1800 years, the most important instrument in astronomy for determining the positions of celestial objects.



Eratosthenes achievements

He completed a star catalogue containing 675 stars, which was not preserved.

He invented geography. He produced the first map of the entire known world featuring meridian lines and parallel lines.



References:

- https://www.famousscientists.org/eratosthenes/
- https://www.ancient.eu/Eratosthenes/
- https://en.wikipedia.org/wiki/Eratosthenes
- https://www.britannica.com/topic/Measuring-the-Earth-Classical-and-Arabic-1673315
- https://eratosthenes.ea.gr/content/erastosthenes-garagoa
- https://www.pinterest.co.uk/pin/24980972903584980/
- https://etc.usf.edu/maps/pages/10400/10489/10489.htm

This presentation was created by students taking part in the programme "Four Seasons in the Sky"

Erasmus+

eTwinning