



Stars of the Universe

Measuring Space

Distances in space are often measured and talked about in light years whereas for distances within our Solar System, astronomers use a measurement called Astronomical Unit (AU).

Light years

Distances in space are vast and can be very difficult to comprehend. Distances in space are often measured and talked about in light years. A light year is the distance that light travels in one year. Scientists know the speed of light to be 300 000 kilometres per second and therefore, in one year, light travels about 10 trillion kilometres. The distance between Earth and Alpha Centauri is about 4.35 light years. From the Sun to Earth is about 150 million kilometres, which is just 0.000016 light years or 8 light minutes!

Astronomical Units (AU)

To describe distances within our solar system, astronomers use a measurement called an Astronomical Unit (AU). An AU is defined as the average distance between Earth and the Sun; this is about 150 million kilometres. As Earth's orbit of the Sun is an elliptical shape, the distance between the Earth and the Sun change, and therefore AU is a measure of its average distance. So, the Earth is 1 AU from the Sun, Mercury is 0.387 AU, and Neptune is about 30 AU.

Task: Complete the following tables of distances in space and then choose one of the tables and construct a **bar graph** using the data it contains.

Table 1: Distance from Sun to the planets and other space objects

Planets & other objects	Astronomical Unit (AU)
Mercury	0.387
Venus	
Earth	1.00
Mars	
Jupiter	
Saturn	
Uranus	
Neptune	30.06
Kuiper Belt	
Voyager 1 – farthest spacecraft	133





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Table 2: Distance from us to celestial objects outside our Solar System

Celestial objects	Light years
Alpha Centauri	4.35
Sirius	
Aldebaran	
Pleiades star cluster	
Betelgeuse	
Cygnus X-1	
Omega Centauri	
Andromeda Galaxy	

(Hint: as the data range is so large, you may want to leave Omega Centauri and Andromeda Galaxy off your graph)

