

Scientific Notation Quiz Tomorrow

1) Write the following in scientific notation:

a. 0.000 000 745 = 7.45×10^{-7}

b. 5.620 000 = 5.62×10^6

c. 3241 = 3.241×10^3

2) Write the following in standard form:

a. 2.067×10^{-5} = 0.00002067

b. 1.36×10^4 = 13600

c. $10 \times 10 \times 10 \times 10$ = 10000

Distances to the Stars

One neat thing about light-years is that it is like looking back in time.

The distance to the stars is extremely big. The unit that we use to measure large distances is the light-year.

The light-year is the distance that light travels in one year. Light travels at an enormous speed in space, about 300 000 km per second. So in one year it can travel about

1 lightyear = 9.46×10^{12} km.

How to calculate kilometers using light years?

If a star is 8.2 light years away, how many Km is this?

calculator | Light year = 9.46×10^{12} Km

8.2 light years $\times \frac{9.46 \times 10^{12} \text{ km}}{\text{light year}} = 7.7572 \times 10^{13} \text{ Km}$

$$1 \text{ light year} = 9.46 \times 10^{12} \text{ km}$$

a) If a Star is 1.419×10^{14} km away,
How many light years is this?

$$1.419 \times 10^{14} \text{ km} \times \frac{1 \text{ Light year}}{9.46 \times 10^{12} \text{ km}} = 15 \text{ light years}$$

b) If a star is 22 light years away, then
What is the distance in km?

$$22 \text{ Light years} \times \frac{9.46 \times 10^{12} \text{ km}}{1 \text{ Light year}} = 2.0812 \times 10^{14}$$

500 cm to ___ m

$$1 \text{ cm} = 10 \text{ mm}$$

$$1 \text{ m} = 100 \text{ cm}$$

$$1 \text{ km} = 1000 \text{ m}$$

$$500 \cancel{\text{cm}} \times \frac{1 \text{ m}}{100 \cancel{\text{cm}}} = 5 \text{ m}$$

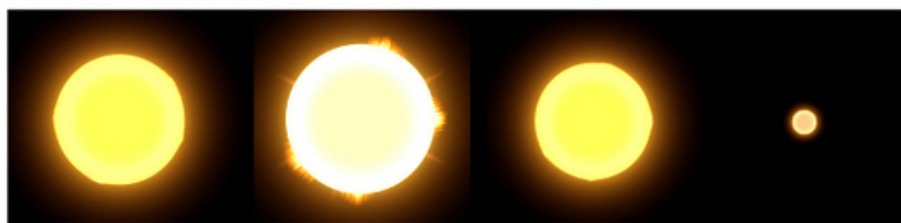
Fun Note:

The light that we see from the star Alpha Centauri tonight left the star 4.3 years ago. So the light takes 4.3 years to reach earth.



.


STARS COMPARED




Sun	Alpha Centauri A	Alpha Centauri B	Proxima Centauri
SPECTRAL TYPE (SUN = G2 V):	G2 V	K1 V	M5.5 Ve
MASS (SUN = 1):	1.1	0.97	0.12
LUMINOSITY (SUN = 1):	1.52	0.5	0.0017
DISTANCE FROM EARTH (LIGHT-YEARS):	4.37	4.37	4.24

ALPHA CENTAURI B'S EARTH-SIZE PLANET

Astronomers at the European Southern Observatory announced in Oct., 2012 the discovery of a planet similar in size to the Earth orbiting Alpha Centauri B. The planet, called Alpha Centauri Bb, is too close to its star to be habitable, but it is the closest alien world yet found.

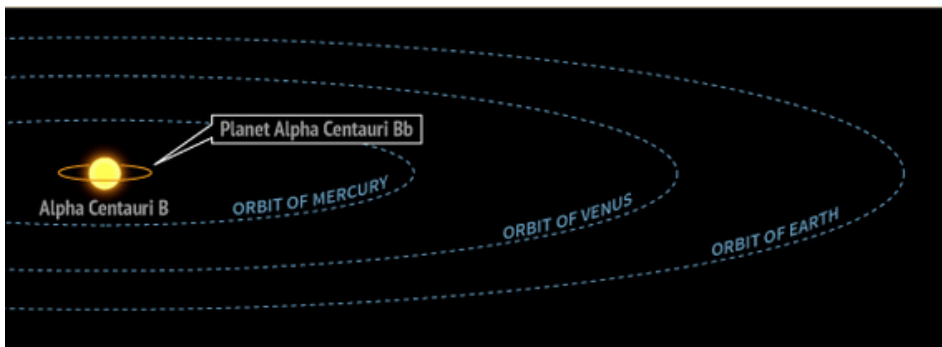


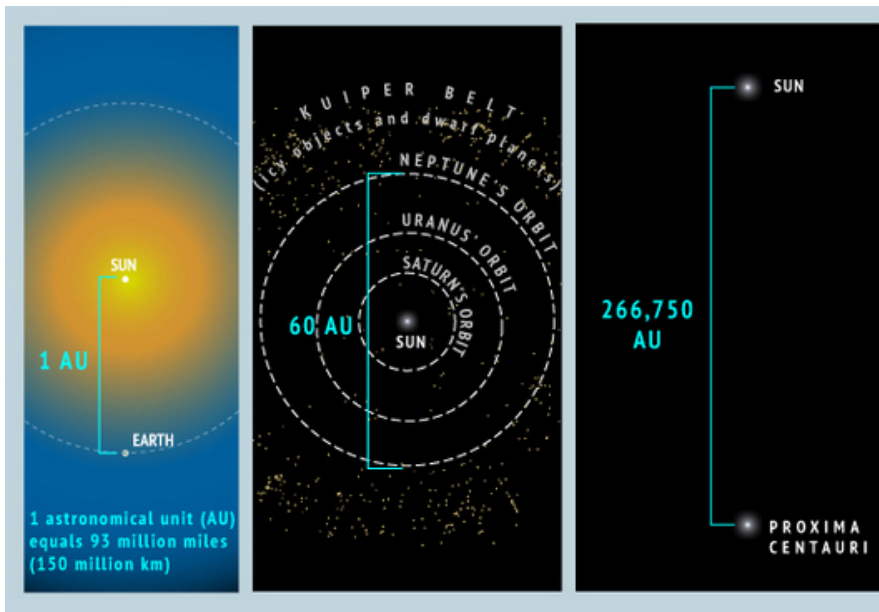
Alpha Centauri Bb



Earth

MASS (EARTH = 1):	1.13	1.0
DISTANCE FROM PARENT STAR:	3.6 million miles (6 million kilometers)	93 million miles (150 million km)
LENGTH OF YEAR (EARTH DAYS):	3.2	365.3





- The Crab supernova remnant is about 4,000 light-years away.
- The Milky Way Galaxy is about 150,000 light-years across.
- The Andromeda Galaxy is 2.3 million light-years away.

Distance from Earth to Proxima Centauri, the next nearest star



red dwarf

←→
~40,000,000,000,000 km

or

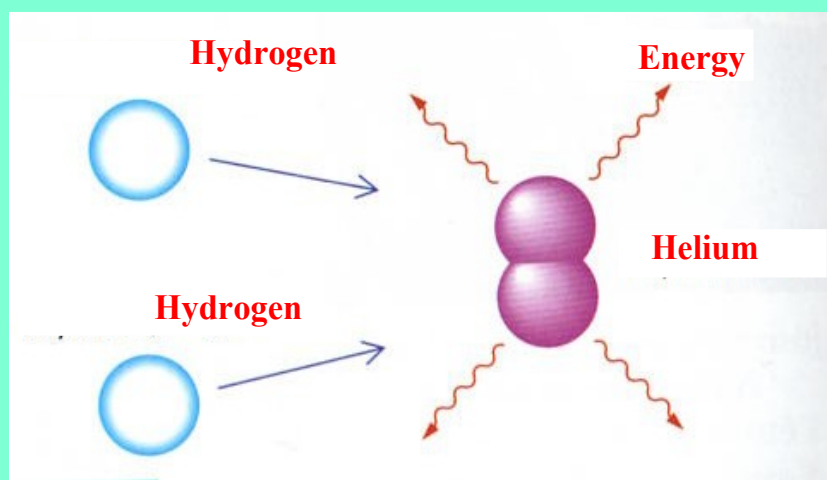
~4.24 light-years

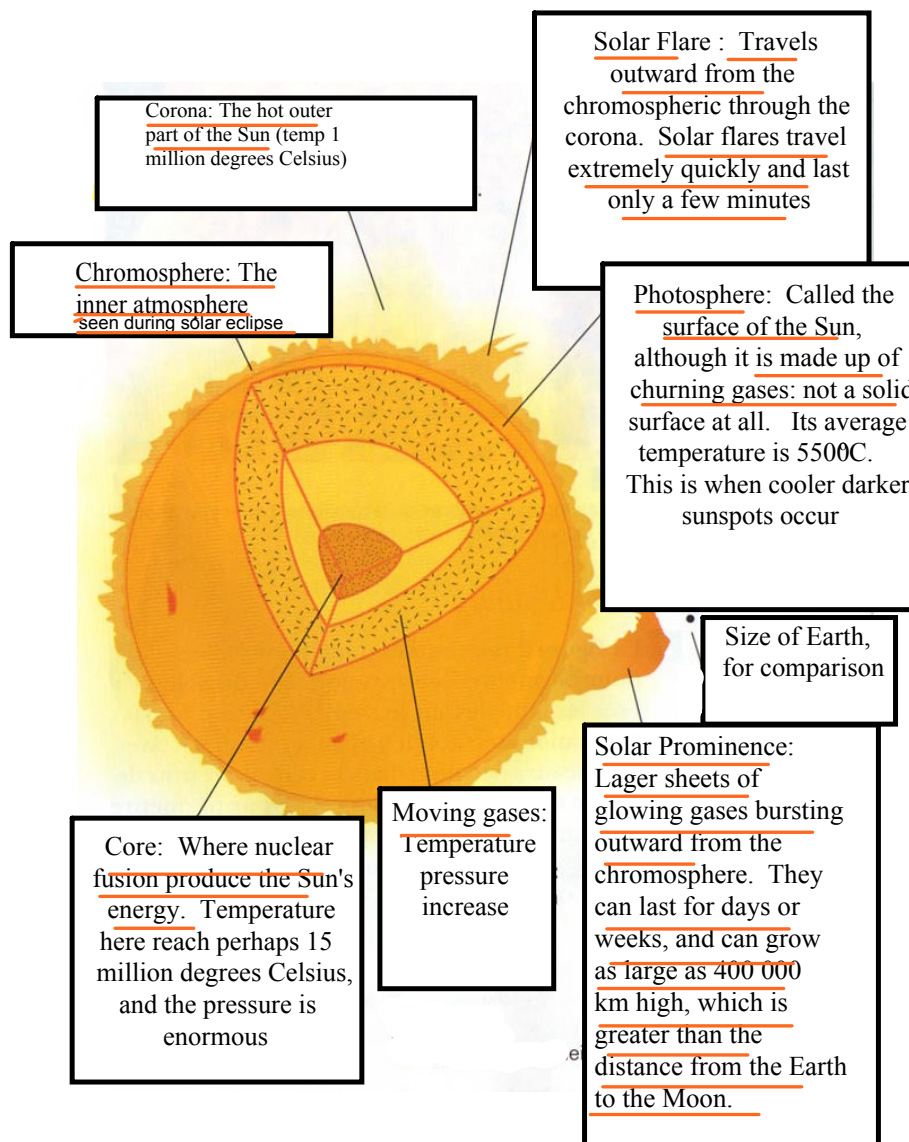
The Sun: An Important Star

the amazing sun
(6:50)

- closest star
- brightest object in the sky
- The sun has been producing energy for about 5 billion years already, and they predict that it will produce energy for another 5 billion years before it runs out of fuel.

The Sun produces energy by a process called nuclear fusion. In the Sun's core, there is so much pressure and temperature that 2 hydrogen atoms fuse together to form 1 helium atom. This process produces large amounts of energy in the form of heat, light and other forms.





Solar Flares

Photos

A flare is defined as a sudden, rapid, and intense variation in brightness. A solar flare occurs when magnetic energy that has built up in the solar atmosphere is suddenly released in the form of radiation.

Solar flares cause the Northern Lights & interference with radio transmissions, satellites, transformers

© Brian and Shawn Malone www.lakesuperiorphoto.com

https://www.youtube.com/watch?v=Uj2u2_siU80

<https://www.youtube.com/watch?v=5O-wAYKBBSsc>

<https://www.youtube.com/watch?v=Pz870WqsN78>

