

Light Year

Contrary to the name, a light year is a measure of **distance** and **not** time.

1 light year is the distance light travels in 1 year.

Light is an electromagnetic wave which travels at a speed of $300\,000\,000\text{ ms}^{-1}$.

Question

How far does light travel in one year?

$$d = ?$$

$$v = 300\,000\,000\text{ ms}^{-1}$$

$$t = 1 \times 365 \times 24 \times 60 \times 60 = 31\,536\,000\text{ s}$$

$$d = v t$$

$$d = 300\,000\,000 \times 31\,536\,000$$

$$d = 9\,460\,800\,000\,000\,000\text{ m}$$

one light year = $9\,460\,800\,000\,000\,000\text{ m}$

As the distances in the universe are very large we need to use the term light year instead of metres or even miles. Below are distances you will be required to know.

Approximate distance from **Earth** to:

- **The Sun** – 0.000016 light years (or 8.3 light minutes)
- **Proxima Centauri** (nearest star outside the solar system) – 4.2 light years
- **Canis Major Dwarf** (nearest galaxy to the Milky Way) – 25000 light years
- The **edge of the known Universe** – 46 billion light years.