

Name: _____

Period: ____ Date: _____

Light-year Calculation Practice Astronomy

Distances are so great in space that a special unit of measurement is used. It is called a light-year. This sounds like a measurement of time, but it is a unit used to measure distance. By definition a light-year is the distance that light travels in one year. To calculate the distance of one light-year, you determine the number of seconds in a year and then multiply that number by the speed of light. Light is the fastest thing we know of, as it travels at an incredible 186,000 miles (300,000 kilometers) per second.

First, calculate the value of one light-year.

If there are 3.154×10^7 seconds in a year, calculate the number of kilometers, in a light-year by multiplying the number of seconds in a year by 300,000 km.

Now that you know how many kilometers are in a light-year, determine the distance of these objects.

Speed of light = 300,000 km / sec

1 LY = 63,240 AU

1 AU = 1.496×10^8 km

1 LY = 9.46×10^{12} km

1. The closest star to Earth other than the sun is 4.3 light-years away. How many km is that? How many AUs is that?
2. The Andromeda galaxy is 2.2 million light-years away from Earth. How many km is that? How many AUs is that?
3. The diameter of the Milky Way galaxy is 100,000 light-years. How many km is that? How many AUs is that?
4. How many light-years for a beam of light, such as a radio signal, to travel from an Earth laboratory to a spacecraft on Mars, a distance of about 35,000,000 miles (56,000,000 km)? How many AUs?



