

# Scientific Notation

## I. Introduction

In astronomy (and other sciences) we need to utilize both large and small measurements for time, distance, mass, and other units. We need to make measurements to compare data gathered by scientists at different times and locations, to communicate information and to formulate and confirm theories. In this lab, you will practice writing numbers using scientific notation and learn the meanings of metric prefixes and symbols.

## II. Lab

Your goal in this section is to fill the mission portions of the table on the following page.

1. Column A contains the unit names of the numbers listed in column B. In column C, you should write the same numbers, but in scientific notation. The first number has already been done for you, to get you started.
2. Column D lists metric prefixes that may be added to a metric unit, thereby allowing you to write a number without the corresponding scientific notation. For example, one-billionth of a meter, as shown in the table, may be written in scientific notation as  $1 \times 10^{-9}$  meters. It may also be written as 1 *nanometer* (1 nm). In column E, you should research and fill in the letters or symbols that correspond to each of the prefixes already listed in column D. The first symbol has already been filled in for you, to get you started.

## III. Questions

1. How would you write the number 50,000 in scientific notation ?
2. How would you write the number 7 millionths in scientific notation ?
3. How would you write the number  $3.5 \times 10^7$  in standard notation ?
4. Why is an understanding of scientific notation and its uses important in the study of astronomy and other sciences ?

A	B	C	D	E
Unit	Standard Notation	Scientific Notation	Metric Prefix	Symbol
billionth	0.000000001	$1 \times 10^{-9}$	nano	n
hundred millionth	0.00000001			
ten millionth	0.0000001			
millionth	0.000001		micro	
hundred thousandth	0.00001			
ten thousandth	0.0001			
thousandth	0.001		milli	
hundredth	0.01		centi	
tenth	0.1		deci	
one	1			
ten	10		deca	
hundred	100		hecta	
thousand	1000		kilo	
ten thousand	10,000			
hundred thousand	100,000			
million	1,000,000		mega	
ten million	10,000,000			
hundred million	100,000,000			
billion	1,000,000,000		giga	
ten billion	10,000,000,000			
hundred billion	100,000,000,000			
trillion	1,000,000,000,000		tera	