

Chapter 1: Math Modeling

Section 1.1: Scientific Notation

Scientific notation is a way to express very large or very small numbers in an easy to express and read way.

- A number written in scientific notation is expressed in the form:

$$a \times 10^n$$

[$1 \leq a < 10$ WHERE n IS AN INTEGER]

Examples of Large Numbers

WORLD POPULATION: 7,000,000,000

CHINA'S POPULATION: 1,300,000,000

U.S. POPULATION: 317,000,000

MARK ZUCKERBERG'S WORTH: \$50,000,000,000

Scientific Notation

$$7.0 \times 10^9$$

$$1.3 \times 10^9$$

$$3.17 \times 10^8$$

$$\$5.0 \times 10^{10}$$

Examples of Small Numbers

DIAMETER OF A HUMAN HAIR: 0.00002 in.

WEIGHT OF A GRAIN OF SAND: 0.00000133g

Scientific Notation

$$2.0 \times 10^{-5}$$

$$1.33 \times 10^{-7}$$

Examples of Scientific Notation

$$\underbrace{3.72 \times 10^5}_{3,720,000}$$

$$\underbrace{4 \times 10^{-4}}_{.0004}$$

Equivalent Ordinary Decimal

$$372,000$$

$$.0004$$

List the following from least to greatest:

$$0.0042 \quad \left| \quad \underbrace{3.7 \times 10^{-4}}_{.00037} \quad \left| \quad 0.0000032 \quad \left| \quad \underbrace{3.6 \times 10^{-3}}_{.0316}$$

LEAST: 0.0000032, 0.00037, 0.0042, 0.0316