

F.Y.I.

When the metric system was proposed in 1792, a 10-hour clock was included in the plan. This part of the system was never accepted and was eventually abandoned.

To write measurements using scientific notation, move the decimal point until only one non-zero digit remains on the left. Then count the number of places the decimal point was moved and use that number as the exponent of ten. Thus, the approximate mass of Earth can also be expressed as 6×10^{24} kg. Note that the exponent becomes larger as the decimal point is moved to the left.

To write the mass of the electron in scientific notation, the decimal point is moved 31 places to the right. Thus, the mass of the electron can also be written as 9.11×10^{-31} kg. Note that the exponent becomes smaller as the decimal point is moved to the right.

Practice Problems

Express the following measurements in scientific notation.

- a. 5800 m b. 450 000 m c. 302 000 000 m d. 86 000 000 000 m
- a. 0.000 508 kg b. 0.000 000 45 kg c. 0.003600 kg d. 0.004 kg
- a. 300 000 000 s b. 186 000 s c. 93 000 000 s

A quantity written in scientific notation consists of a number between 1 and 10 followed by 10 raised to a power.

Metric prefixes differ from one another by a power of ten.

FIGURE 2-4. Objects in the universe range from the very small to the unimaginably large.

Prefixes Used With SI Units

Like our number system, the metric system is a decimal system. Prefixes are used to change SI units by powers of ten. Thus, one tenth of a meter is a decimeter, one hundredth of a meter is a centimeter, and one thousandth of a meter is a millimeter. Each of these divisions can be found on a meter stick. The prefixes that change SI units by a power of one thousand are most common. Thus, one thousand meters is a kilometer. Figure 2-4 shows the vast range of lengths of objects in our universe. Commonly used length units are shown.

