Application

A light-year, the distance light travels in one Earth year, is about 5.9×10^{12} miles. A mile is 5.28×10^{3} feet. How many feet are in a light-year?

1 light-year = 5.9×10^{12} miles

1 mile = 5.28×10^{3} feet

How many feet in one light-year?

5.9×10^{12} miles $\times \frac{5.28 \times 10^{3} \text{ ft}}{1 \text{ mile}}$

$(5.9 \times 10^{12})(5.28 \times 10^{3} \text{ ft})$

$5.9 \times 5.28 \times 10^{12} \times 10^{3}$

31.15×10^{15}

$\rightarrow 31.15 \times 10^{15}$

$3.115 \times 10 \times 10^{15}$

3.115×10^{16} ft

A company manufactures 3.2×10^{4} cell phones per month. How many cell phones does it manufacture per year?

3.2×10^{4} cell phones made per month

12 months = 1 year

How many are made per year?

$(3.2 \times 10^{4}) \times 12$

$3.2 \times 12 \times 10^{4}$

38.4×10^{4}

$3.84 \times 10^{1} \times 10^{4}$

$\rightarrow 3.84 \times 10^{5}$ cell phones/year

Quick Check

The speed of light is about 3.0×10^5 kilometers/second. Use the formula $d = rt$ to find the distance light travels in an hour, which is 3.6×10^3 seconds.

$d = rt$

distance = rate • time

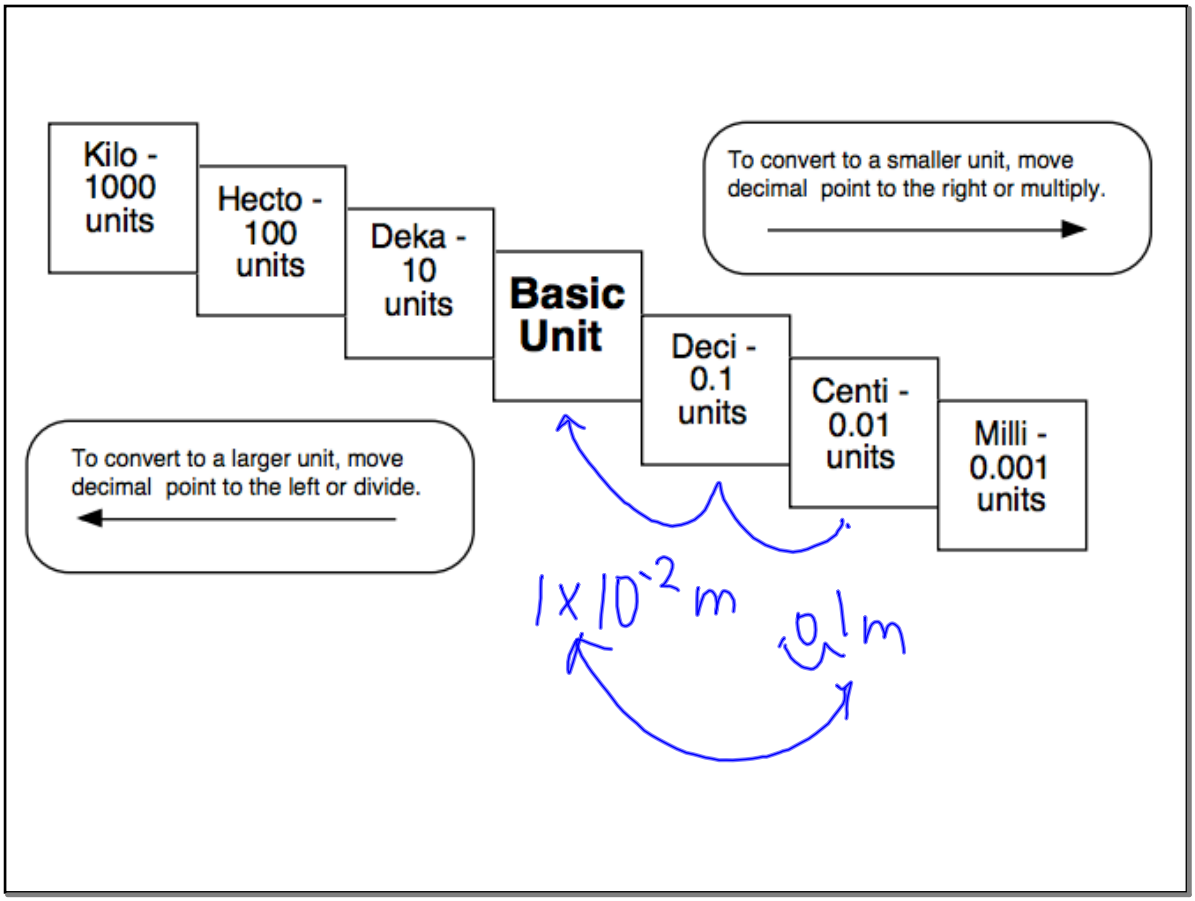
$d = (3.0 \times 10^5 \frac{km}{sec})(3.6 \times 10^3 sec.)$

$d = 3.0 \cdot 3.6 \times 10^5 \times 10^3 \times \frac{km}{sec} \times \frac{sec}{1}$

$d = 10.8 \times 10^8 \text{ km}$

$d = 1.08 \times 10 \times 10^8 \text{ km}$

$\boxed{d = 1.08 \times 10^9 \text{ km}}$

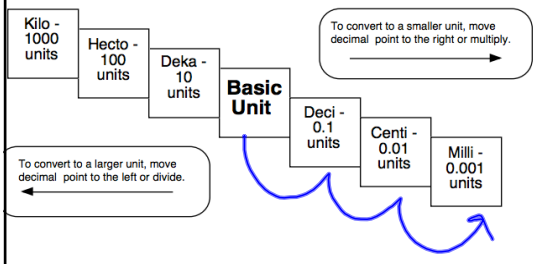


Choosing Units with Scientific Notation

Choose the most reasonable unit to describe the quantity. Then use scientific notation to describe the quantity using the other unit.

The mass of a nickel is 5 g. (g, mg)

$5\text{g} = 5\times10^{3}\text{mg}$ $\quad 5\text{g}\times\frac{10^{3}\text{mg}}{1\text{g}} = 5\times10^{3}\text{mg}$

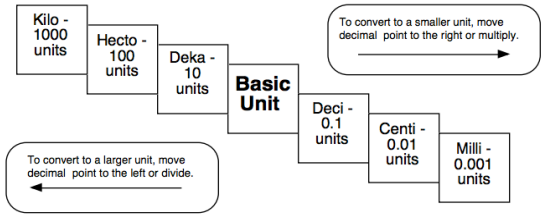


ield is about 91 ___. (km, m)

Quick Check

Choose the most reasonable unit to describe the quantity. Then use scientific notation to describe the quantity using the other unit.

A pencil is 7 ___ long. (cm, m)



Assignment

8th Grade
Lesson 6-3b

Pgs. 190-191 #13-16 all, 19-22