Name:_____ Class:_____ Date:_____

Units and Conversions: Practice 1

Complete the following conversions.
Show your work.

1) 3,500 s = _____ min

2) 67 in = _____ ft

3) 0.75 lb = _____ oz
(16 oz = 1 lb)

4) 1.16 yr = _____ days

*Fill in the blank with **>** or **<**. Show your work.*

5) 6.0 in ____ 15 cm
(2.54 cm = 1 in)

6) 13.0 hr ____ 800 min

7) 115 g ____ 4.00 oz
(28.3 g = 1 oz)\

Solve the following problems. Show your work.

8) Kevin is 17 years old, exactly. For how many hours has Kevin been alive?

9) Sandy enters a 5 km walk. If Sandy's walking stride (the distance she covers in each step) is 26.4 inches, how many steps can she expect to take? (3281 ft = 1 km)

10) You have 4 friends coming over after school and want to make sure you have enough soda! Each person usually drinks two 12 fl oz glasses of soda. At least how many 2 L bottles of soda do you need to buy?.
(34 fl oz = 1 L)

Name:_____ Class:_____ Date:_____

Units and Conversions: Practice 1 SOLUTIONS

Complete the following conversions.
Show your work.

1) 3,500 s = __58.3 ___ min

$$3{,}500\ s \times \left(\frac{1\ min}{60\ s}\right) = 58.3\ min$$

2) 67 in = __5.6 ___ ft

$$67\ in \times \left(\frac{1\ ft}{12\ in}\right) = 5.6\ ft$$

3) 0.75 lb = ___12___ oz
(16 oz = 1 lb)

$$0.75\ lb \times \left(\frac{16\ oz}{1\ lb}\right) = 12\ oz$$

4) 1.16 yr = __423___ days

$$1.61\ yr \times \left(\frac{365\ days}{1\ yr}\right) = 423\ days$$

*Fill in the blank with **>** or **<**. Show your work.*

5) 6.0 in _>_ 15 cm
(2.54 cm = 1 in)

$$6.0\ in \times \left(\frac{2.54\ cm}{1\ in}\right) = 15.24\ cm > 15\ cm$$

6) 13.0 hr _<_ 800 min

$$800\ min \times \left(\frac{1\ hr}{60\ min}\right) = 13.3\ hr > 13.0\ hr$$

7) 115 g _>_ 4.00 oz
(28.3 g = 1 oz)

$$115\ g \times \left(\frac{1\ oz}{28.3\ g}\right) = 4.06 > 4.00\ oz$$

Solve the following problems. Show your work.

8) Kevin is 17 years old, exactly. For how many hours has Kevin been alive?

$$17\ yr \times \left(\frac{365\ day}{1\ yr}\right) \times \left(\frac{24\ hr}{1\ day}\right) = 149{,}000\ hr$$

$$1.49 \times 10^5\ hr$$

9) Sandy enters a 5 km walk. If Sandy's walking stride (the distance she covers in each step) is 26.4 inches, how many steps can she expect to take? (3281 ft = 1 km)

$$5\ km \times \left(\frac{3281\ ft}{1\ km}\right) \times \left(\frac{12\ in}{1\ ft}\right) \times \left(\frac{1\ step}{26.4\ in}\right)$$

$$= 7{,}460\ steps$$

10) You have 4 friends coming over after school and want to make sure you have enough soda! Each person usually drinks two 12 fl oz glasses of soda. At least how many 2 L bottles of soda do you need to buy?.
(34 fl oz = 1 L)
There are 5 people, including you.

$$5\ people \times \left(\frac{2\ glasses}{1\ person}\right) \times \left(\frac{12\ fl\ oz}{1\ glass}\right) \times \left(\frac{1\ L}{34\ fl\ oz}\right)$$

$$\times \left(\frac{1\ bottle}{2\ L}\right) = 1.8\ bottles$$

$$2\ bottles$$

You cannot buy 8/10 of a bottle, so round to the nearest whole number.

Name:_____ Class:_____ Date:_____

Units and Conversions: Practice 2

Complete the following conversions.
Show your work.

1) 42 hours = _____ days

2) 3 feet = _____inches

3) 18 oz = _____ grams
(28.3 g = 1 oz)

4) An adult's large intestine is about $23\ feet$ long. How many meters long is that?
(3.28 ft = 1 m)

5) A small chihuahua weighs $3\ lbs$. How many ounces does it weigh?
(16 oz = 1 lb)

6) A woman's size 8 shoe is approximately $24\ centimeters$ long. How long is it in inches?
(2.54 cm = 1 in)

7) The projected lifespan of an incandescent lightbulb is $1{,}200\ hours$. How many days can you expect it to last if it is left on constantly?

8) A cookie recipe calls for $360\ \mathrm{g}$ of flour. If one cup of all purpose flour weighs $120\ \mathrm{g}$, how many cups of flour are needed to bake three batches of cookies?

9) Helena the Hare challenges Tonya the Tortoise to a race. Helena finishes the race in $3.74\ min$. Tonya finishes in $3\ min$ and $44.2\ s$. Who won the race? By how many seconds did she win?

10) The new xDevice 9.0 comes out in exactly 125 hours! Unfortunately it costs $335 and you've only managed to save $50 so far. You've got a plan. You can earn $30 for every lawn you mow and you have time to mow 2 lawns after school each day. Can you earn enough money in time?! How much money are you short/do you have left over?

Name:_____ Class:_____ Date:_____

Units and Conversions: Practice 2 SOLUTIONS

Complete the following conversions.
Show your work.

1) 42 hours = _1.75_ days

$$42\ hr \times \left(\frac{1\ d}{24\ hr}\right) = 1.75\ d$$

2) 3 feet = _36_ inches

$$3\ ft \times \left(\frac{12\ in}{1\ ft}\right) = 36\ in$$

3) 18 oz = _509_ grams
(28.3 g = 1 oz)

$$18\ oz \times \left(\frac{28.3\ g}{1\ oz}\right) = 509\ g$$

4) An adult's large intestine is about $23\ feet$ long. How many meters long is that?
(3.28 ft = 1 m)

$$23\ ft \times \left(\frac{1\ m}{3.28\ ft}\right) = 7.0\ m$$

5) A small chihuahua weighs $3\ lbs$. How many ounces does it weigh?
(16 oz = 1 lb)

$$3\ lb \times \left(\frac{16\ oz}{1\ lb}\right) = 48\ oz$$

6) A woman's size 8 shoe is approximately $24\ centimeters$ long. How long is it in inches?
(2.54 cm = 1 in)

$$24\ cm \times \left(\frac{1\ in}{2.54\ cm}\right) = 9.4\ in$$

7) The projected lifespan of an incandescent lightbulb is $1{,}200\ hours$. How many days can you expect it to last if it is left on constantly?

$$1{,}200\ hr \times \left(\frac{1\ day}{24\ hr}\right) = 50\ days$$

8) A cookie recipe calls for $360\ g$ of flour. If one cup of all purpose flour weighs $120\ g$, how many cups of flour are needed to bake three batches of cookies?

$$3\ batches \times \left(\frac{360\ g\ flour}{1\ batch}\right) \times \left(\frac{1\ cup\ flour}{120\ g\ flour}\right) = 9\ cups\ of\ flour$$

9) Helena the Hare challenges Tonya the Tortoise to a race. Helena finishes the race in $3.74\ min$. Tonya finishes in $3\ min$ and $44.2\ s$. Who won the race? By how many seconds did she win?

H: $3.74\ min \times \left(\frac{60\ s}{1\ min}\right) = 224.4\ s$

T: $3.00\ min \times \left(\frac{60\ s}{1\ min}\right) = 180\ s$

$180\ s + 44.2\ s = 224.2\ s$

Tonya wins by $0.2\ s$

10) The new xDevice 9.0 comes out in exactly 125 hours! Unfortunately it costs $335 and you've only managed to save $50 so far. You've got a plan. You can earn $30 for every lawn you mow and you have time to mow 2 lawns after school each day. Can you earn enough money in time?! How much money are you short/do you have left over?

Need to earn: $\$335 - \$50 = \$285$

$125\ hr \times \left(\frac{1\ day}{24\ hr}\right) = 5.2\ days$: Have 5 days to get money

$$5\ days \times \left(\frac{2\ lawn}{1\ day}\right) \times \left(\frac{\$30}{1\ lawn}\right) = \$300$$

You earn enough on time: $\$300 > \$285$
And you have $15 leftover.

Name: _____ Period:_____ Date:_____

Conversions and Scientific Notation: Practice 1

Express each quantity using scientific notation:

1) 525,600 min = _____ min

2) 0.0003125 g = _____ g

Express each quantity using standard notation:

3) 5.7×10^{-2} nm = _____ nm

4) 0.43×10^{3} kg = _____ kg

Complete the following conversions.

5) 75 m = _____ cm

6) 1,500 mg = _____ g

7) 340,000 µL = _____ L

Complete the following conversions.

8) A single grain of sand has a mass of $0.011\ g$. How many μg is this?

9) The tallest tree in the United States is a sequoia tree in California. It's height is approximately $84\ m$. What is this height in cm? In km?

10) The distance from New York, NY and Los Angeles, CA is about 2,800 miles. Express this distance in meters. (1.61 km = 1 mi)

Name: _____ Period:_____ Date:_____

Conversions and Scientific Notation: Practice 1 SOLUTIONS

Express each quantity using scientific notation:

1) 525,600 min = __5.256×10^5__ min

Decimal moves 5 places to the left: exponent = +5

2) 0.0003125 g = __3.125×10^{-4}__ g

Decimal moves 4 places to the right: exponent = -4

Express each quantity using standard notation:

3) 5.7 x 10^{-2} nm = ____0.057_____ nm

Exponent is negative, move decimal to the LEFT

4) 0.43 x 10^3 kg = _____430____ kg

Exponent is positive, move decimal to the RIGHT

Complete the following conversions.

5) 75 m = _7.5×10^3_ cm

$$75\ m \times \left(\frac{100\ cm}{1\ m}\right) = 7{,}500\ cm$$

6) 1,500 mg = ____1.5_____ g

$$1{,}500\ mg \times \left(\frac{1\ g}{1000\ mg}\right) = 1.5\ g$$

7) 340,000 µL = ___3.4×10^{-1}____ L

$$340{,}000\ \mu L \times \left(\frac{1 \times 10^{-6}\ L}{1\ \mu L}\right) = 0.34\ L$$

Complete the following conversions.

8) A single grain of sand has a mass of $0.011\ g$. How many μg is this?

$$0.011\ g \times \left(\frac{1\ \mu g}{1 \times 10^{-6}\ g}\right) = 11{,}000\ \mu g = 1.1 \times 10^4 \mu g$$

9) The tallest tree in the United States is a sequoia tree in California. It's height is approximately $84\ m$. What is this height in cm? In km?

$$84\ m \times \left(\frac{100\ cm}{1\ m}\right) = 8{,}400\ cm = 8.4 \times 10^3\ cm$$

$$84\ m \times \left(\frac{1\ km}{1000\ m}\right) = 0.084\ km = 8.4 \times 10^{-2}\ km$$

10) The distance from New York, NY and Los Angeles, CA is about 2,800 miles. Express this distance in meters. (1.61 km = 1 mi)

$$2{,}800\ mi \times \left(\frac{1.61\ km}{1\ mi}\right) \times \left(\frac{1000\ m}{1\ km}\right) = 4{,}510{,}000\ m$$
$$= 4.51 \times 10^6 m$$

Name:_____ Class:_____ Date:_____

Conversions and Scientific Notation: Practice 2

Express each quantity using scientific notation:

1) 0.0000371 s = _____ s

2) 4,110,000,000 kg = _____kg

3) 16 m = _____m

Express each quantity using standard notation:

4) 2.25×10^{5} km = _____km

5) 8.3×10^{-2} mg = _____mg

6) 3.5×10^{0} L = _____L

Complete the following conversions.

7) 0.3 mL = _____L

8) 9,416,000 g = _____Mg

9) 215 μm = _____m

10) 70 Gs = _____ns

11) 1.65×10^{-5} kg = _____mg

Complete the following conversions.

12) There are approximately 7,456,000,000 people on the planet. If the average weight of a human is 62 kg, what is the total weight of the human population?

13) There are 28 computers in the computer lab. If each computer has a 40 GB hard drive, how many bytes (B) of storage space does the computer lab have?

14) Each kidney is capable of filtering out about 1.3 L of blood every minute. A person has two kidneys. How many mL of blood can be filtered by your kidneys in 5 minutes? Express your answer in scientific notation.

15) The diameter of the Earth is about 7,900 mi. How far is this distance in centimeters? (1 mi = 1.6 km)

Name:_____ Class:_____ Date:_____

Conversions and Scientific Notation: Practice 2 SOLUTIONS

Express each quantity using scientific notation:

1) 0.0000371 s = __3.71×10^{-5}__ s

Decimal moves 5 places to the right: exponent = -5

2) 4,110,000,000 kg = __4.11×10^{9}___ kg

Decimal moves 9 places to the left: exponent = 9

3) 16 m = ____1.6×10^{1}____ m

Decimal moves 1 places to the left: exponent = 1

Express each quantity using standard notation:

4) 2.25 x 10^5 km = ___225,000___ km

Exponent is positive, move decimal to the right

5) 8.3 x 10^{-2} mg = ____0.083___ mg

Exponent is negative, move decimal to the left

6) 3.5 x 10^0 L = _____3.5____ L

Exponent is zero, $10^0 = 1$, decimal does not move

Complete the following conversions.

7) 0.3 mL = ___3.0×10^{-4}___ L

$$0.3\ mL \times \left(\frac{1 \times 10^{-3}\ L}{1\ mL}\right) = 0.0003\ L$$

8) 9,416,000 g = ____9.416_____ Mg

$$9{,}416{,}000\ g \times \left(\frac{1\ Mg}{1 \times 10^{6} g}\right) = 9.416\ Mg$$

9) 215 μm = ___2.15×10^{-4}___ m

$$215\ \mu m \times \left(\frac{1 \times 10^{-6}\ m}{1\ \mu m}\right) = 0.000215\ m$$

10) 70 Gs = ____7×10^{19}___ ns

$$70\ Gs \times \left(\frac{1 \times 10^{9}\ s}{1\ Gs}\right) \times \left(\frac{1\ ns}{1 \times 10^{-9}\ s}\right) = 7 \times 10^{19}\ ns$$

11) 1.65 x 10^{-5} kg = ___16.5___ mg

$$1.65 \times 10^{-5} kg \times \left(\frac{1000\ g}{1\ kg}\right) \times \left(\frac{1\ mg}{1 \times 10^{-3}\ g}\right) = 16.5\ mg$$

Complete the following conversions.

12) There are approximately 7,456,000,000 people on the planet. If the average weight of a human is 62 kg, what is the total weight of the human population?

$$7.456 \times 10^{9}\ people \times \left(\frac{62\ kg}{1\ person}\right) = 4.63 \times 10^{11}\ kg$$

13) There are 28 computers in the computer lab. If each computer has a 40 GB hard drive, how many bytes (B) of storage space does the computer lab have?

$$28\ computers \times \left(\frac{40\ GB}{1\ computer}\right) \times \left(\frac{1 \times 10^{9}\ B}{1\ GB}\right) = 1.12 \times 10^{12}\ B$$

This assumes decimal system, rather than a binary system

14) Each kidney is capable of filtering out about 1.3 L of blood every minute. A person has two kidneys. How many mL of blood can be filtered by your kidneys in 5 minutes? Express your answer in scientific notation.

$$5\ min \times \left(\frac{1.3\ L}{1\ min\ \cdot 1\ kidney}\right) \times \left(\frac{1000\ mL}{1\ L}\right) = 6{,}500\ \frac{mL}{kidney}$$

$$2\ kidneys \times \left(\frac{6{,}500\ mL}{1\ kidney}\right) = 13{,}000\ mL$$

15) The diameter of the Earth is about 7,900 mi. How far is this distance in centimeters? (1 mi = 1.6 km)

$$7{,}900\ mi \times \left(\frac{1.61\ km}{1\ mi}\right) \times \left(\frac{1000\ m}{1\ km}\right) \times \left(\frac{1000\ cm}{1\ m}\right) = 1.27 \times 10^{10}\ cm$$

Name:_____ Class:_____ Date:_____

Fractional Units and Units with Exponents

Complete the following conversions.

1) 2.0 km/min = _____ m/s

2) 16 ft^2 = _____ in^2

3) 4.5 kg/m^3 = _____ g/cm^3

4) If a small flower bed is 2.6 yd^2, what is its area in square feet?
(3 ft = 1 yd)

5) Humans have about 1.6 m^2 of skin! How many square feet of skin does the 100 person US Senate have?
(1 m = 3.28 ft)

6) At the 2016 Summer Olympics, Elaine Thompson won the 100 m, running with an average speed of approximately 9.3 m/s. How fast did she run in mph?
(1 mi = 1.61 km)

7) A pasture is enclosed by a square fence with sides that are 161 ft long. What is the area of the pasture in m^2?

8) Liquid mercury has a density of 13.5 g/cm^3. How many kilograms would one cubic meter weigh?

9) The average heart rate of a human is about 75 beats per minute. If the heart can pump 70 mL of blood in each beat, how many cubic millimeters does your heart pump in one second? (1000 cm^3 = 1 L)

10) Water rushes over Niagara Falls at an astounding rate of 84,760 cubic feet per second (ft^3/s). If a standard water bottle holds 16.9 fl.oz, how many water bottles could you fill from Niagara Falls in 1 minute?
(1 L = 33.8 fl oz)

Name:_____ Class:_____ Date:_____

Fractional Units and Units with Exponents SOLUTIONS

Complete the following conversions.

1) 2.0 km/min = _33___ m/s

$$2.0\,\frac{km}{min}\times\left(\frac{1\ min}{60\ s}\right)\times\left(\frac{1000\ m}{1\ km}\right)$$

2) 16 ft^2 = __2,300__ in^2

$$16\ ft^2\times\left(\frac{12\ in}{1\ ft}\right)^2=2{,}300\ in^2$$

3) 4.5 kg/m^3 = ___0.0045_ g/cm^3

$$4.5\,\frac{kg}{m^3}\times\left(\frac{1000\ g}{1\ kg}\right)\left(\frac{1\ m}{100\ cm}\right)^3=0.0045\,\frac{g}{cm^3}$$

4) If a small flower bed is 2.6 yd^2, what is its area in square feet?
(3 ft = 1 yd)

$$2.6\ yd^2\times\left(\frac{3\ ft}{1\ yd}\right)^2=23\ ft^2$$

5) Humans have about 1.6 m^2 of skin! How many square feet of skin does the 100 person US Senate have?
(1 m = 3.28 ft)

$$100\ people\times\left(\frac{1.6\ m^2}{1\ person}\right)\times\left(\frac{3.28\ ft}{1\ m}\right)^2=1{,}700\ ft^2$$

6) At the 2016 Summer Olympics, Elaine Thompson won the 100 m, running with an average speed of approximately 9.3 m/s. How fast did she run in mph?
(1 mi = 1.61 km)

$$9.3\,\frac{m}{s}\times\left(\frac{60\ s}{1\ min}\right)\times\left(\frac{60\ min}{1\ hr}\right)\times\left(\frac{1\ km}{1000\ m}\right)\times\left(\frac{1\ mi}{1.61\ km}\right)=21\,\frac{mi}{h}$$

7) A pasture is enclosed by a square fence with sides that are 161 ft long. What is the area of the pasture in m^2?

$$161\ ft^2\times\left(\frac{1\ m}{3.28\ ft}\right)^2=15\ m^2$$

8) Liquid mercury has a density of 13.5 g/cm^3. How many kilograms would one cubic meter weigh?

$$13.5\,\frac{g}{cm^3}\times\left(\frac{1\ kg}{1000\ g}\right)\times\left(\frac{100\ cm}{1\ m}\right)^3=13{,}500\,\frac{kg}{m^3}$$

9) The average heart rate of a human is about 75 beats per minute. If the heart can pump 70 mL of blood in each beat, how many cubic millimeters does your heart pump in one second? (1000 cm^3 = 1 L)

$$1\ s\times\left(\frac{1\ min}{60\ s}\right)\times\left(\frac{75\ beats}{1\ min}\right)\times\left(\frac{70\ mL}{1\ beat}\right)\times\left(\frac{1\ L}{1000\ mL}\right)\times\left(\frac{1000\ cm^3}{1\ L}\right)\times\left(\frac{10\ mm}{1\ cm}\right)^3=87{,}500\ mm^3$$

10) Water rushes over Niagara Falls at an astounding rate of 84,760 cubic feet per second (ft^3/s). If a standard water bottle holds 16.9 fl.oz, how many water bottles could you fill from Niagara Falls in 1 minute?
(1 L = 33.8 fl oz)

$$84{,}760\,\frac{ft^3}{s}\times\left(\frac{1\ m}{3.28}\right)^3\times\left(\frac{100\ cm}{1\ m}\right)^3\times\left(\frac{1\ L}{1000\ cm^3}\right)\times\left(\frac{33.8\ fl\ oz}{1\ L}\right)\times\left(\frac{1\ bottle}{16.9\ fl\ oz}\right)\times\left(\frac{60\ s}{1\ min}\right)=2.9\times10^8\,\frac{bottles}{min}$$