

HOMEWORK SCI NOTATION

East HS Chemistry

Mr. Genest



Name

ANSWERS

Period

This will be on Test 2, Oct. 16

Convert the following to scientific notation.

1. 0.005 = $5. \times 10^{-3}$

2. 5.050 = 5.05×10^0

3. 0.0008 = $8. \times 10^{-4}$

4. 1,000 = $1. \times 10^3$

5. 1,000,000 = $1. \times 10^6$

6. 0.25 = 2.5×10^{-1}

7. 0.025 = 2.5×10^{-2}

8. 0.0025 = 2.5×10^{-3}

9. 500 = $5. \times 10^2$

10. 5,000 = $5. \times 10^3$

Convert the following to standard notation.

1. $1.5 \times 10^3 = 1500$

2. $1.5 \times 10^{-3} = 0.0015$

3. $3.75 \times 10^{-2} = 0.0375$

4. $3.75 \times 10^2 = 375$

5. $2.2 \times 10^5 = 220000$

6. $3.35 \times 10^{-1} = 0.335$

7. $1.2 \times 10^{-4} = 0.00012$

8. $1 \times 10^4 = 10000$

9. $1 \times 10^{-1} = 0.1$

10. $4 \times 10^0 = 4$

Memorize this table by Friday, October 17

G	?	?	M	?	?	k	?	?	?	?	c	m	?	?	μ	?	?	n	?	?	p
giga			mega			kilo			base		centi	milli			micro			nano			pico

- | | |
|--|--|
| 1. For every 1 megagram there are how many grams?
$1,000,000$ | 3. For every 1 km there are how many m?
1000 |
| 2. For every 1 liter there are how many cL?
100 | 4. For every 1 g there are how many μg?
$1,000,000$ |

5. Convert 0.040 km to cm

$$\frac{0.040 \text{ km}}{1} \times \frac{1000 \text{ m}}{1 \text{ km}} \times \frac{100 \text{ cm}}{1 \text{ m}} = 40000 \text{ cm okay}$$

$4.0 \times 10^4 \text{ cm}$ better because it shows two sig figs

6. Use the density table from an old worksheet. If you had 6010 g of titanium, how many mL of titanium would you have?

$$\frac{6010 \text{ g titanium}}{4.54 \text{ g Titanium}} \times \frac{1 \text{ mL Titanium}}{1 \text{ g Titanium}} = 1323.7 =$$

rounds to 1320 mL

Solve these using your EXP or your 10^x key write your answers to the correct number of significant figures

7. $(2.4904 \times 10^3) \times (2.14 \times 10^{-3}) = 5.33 \times 10^0$ or simply 5.33

8. $(4.501 \times 10^{-11} + 8.33 \times 10^{-12}) / (3.8 \times 10^{-4}) = 1.40 \times 10^{-7}$

9. $\frac{3.14 \text{ m}}{7.0116 \times 10^{-5} \text{ g}} \times \frac{4.05 \times 10^{-2} \text{ m}}{1.04 \times 10^{10} \text{ s}} \times \frac{8.8 \times 10^3 \text{ s}}{1.04 \times 10^{10} \text{ s}} = 1.5 \times 10^{-3} \frac{\text{m}^2}{\text{g}}$ ← notice the units

10. $\frac{6.13 \text{ m}^2}{4.6 \text{ s}} \times \frac{7.075 \times 10^{-2} \text{ m}}{1.04 \times 10^{10} \text{ m}^3} \times \frac{8.04 \times 10^{-3} \text{ s}}{1.04 \times 10^{10} \text{ m}^3} = 7.3 \times 10^{-14}$ unitless (all units cancelled)

11. Use the significant figures rule for multiplying to express the following results. Use the

EXP, EE, or 10^x key on your calculator!

a. $= \frac{(2.3 \times 10^6 \text{ g})(8.57 \times 10^3 \text{ mL})}{4.3 \times 10^2 \text{ g}} = 45839534 = 46000000 = 4.6 \times 10^7 \text{ mL}$

b. $= \frac{(1.4 \times 10^3 \text{ atm})(2.35 \times 10^5 \text{ L})}{3 \times 10^{-2} \text{ atm}} = 1.0966 \times 10^{10} \text{ L} = 1 \times 10^{10} \text{ L}$

CAUTION THE FOLLOWING TWO PROBLEMS HAVE BEEN DONE WRONG. IT IS YOUR JOB TO FIND THE ERRORS IN THE SET UP, REWRITE THE SET UP, AND CALCULATE AN ANSWER

Remember to record your answer with the correct number of significant digits.

3. A newborn baby is found to be 19.75" long. What is the length of the newborn in millimeters? Record your answer in scientific notation.

$\frac{19.75 \text{ in}}{1 \text{ in}} \times \frac{2.54 \text{ cm}}{2.54 \text{ cm}} \times \frac{10 \text{ mm}}{1 \text{ cm}} = 1.75 \times 10^1 \text{ g}$

Four three infinite*
 $19.75 \text{ in} \times \left(\frac{2.54 \text{ cm}}{1 \text{ in}}\right) \times \left(\frac{10 \text{ mm}}{1 \text{ cm}}\right) = 501.65$

useful conversion:	
1 cm ³	= 1 mL
2.54 cm	= 1 in
12 in	= 1 ft
3 ft	= 1 yd
5280 ft	= 1 mile
1 km	= 1000 m
454 g	= 1 lb
1 ton	= 2000 lbs
1 m ³	= 1000 L
1 g water	= 1 mL

4. How many kilograms of water are in 150.0 mL of liquid?

$\frac{150 \text{ mL water}}{150 \text{ mL water}} \times \frac{1 \text{ g}}{1 \text{ g}} \times \frac{1 \text{ kg}}{1 \text{ g}} \times =$

$150.0 \text{ mL} \times \left(\frac{1 \text{ g}}{1 \text{ mL}}\right) \times \left(\frac{1 \text{ kg}}{1000 \text{ g}}\right) = 0.1500 \text{ kg}$
 four sig figs infinite s.f. infinite s.f.

Answer should have four sig figs

* INFINITE SIG. FIGS. ARE FOR :

- COUNTED THINGS

- DEFINITIONS OF UNITS FROM A DICTIONARY