

# Chemistry Chapter 2 Worksheet

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Name: \_\_\_\_\_

Provide a short and specific definition in YOUR OWN WORDS. Do not use the definition from the book

Additional Notes:

Accuracy \_\_\_\_\_

\_\_\_\_\_

Conversion Factor \_\_\_\_\_

\_\_\_\_\_

Density \_\_\_\_\_

\_\_\_\_\_

Derived Unit \_\_\_\_\_

\_\_\_\_\_

Dimensional Analysis \_\_\_\_\_

\_\_\_\_\_

Directly Proportional \_\_\_\_\_

\_\_\_\_\_

Hypothesis \_\_\_\_\_

\_\_\_\_\_

Inversely Proportional \_\_\_\_\_

\_\_\_\_\_

Model \_\_\_\_\_

\_\_\_\_\_

Percentage Error \_\_\_\_\_

\_\_\_\_\_

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Precision \_\_\_\_\_

\_\_\_\_\_

Quantity \_\_\_\_\_

\_\_\_\_\_

Scientific Method \_\_\_\_\_

\_\_\_\_\_

SI \_\_\_\_\_

\_\_\_\_\_

Significant Figures \_\_\_\_\_

\_\_\_\_\_

System \_\_\_\_\_

\_\_\_\_\_

Theory \_\_\_\_\_

\_\_\_\_\_

Volume \_\_\_\_\_

\_\_\_\_\_

Weight \_\_\_\_\_

\_\_\_\_\_

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## Section 2.1

1. Make sure to complete the "Scientific Method Worksheet"
2. You are in the pantry at your grandparents home when you find a white, crystalline solid in an unidentified container. You perform some experiments on this solid and find that it has a density of  $1.59 \text{ g/cm}^3$  and that it dissolves in water. Which of the properties are qualitative and which are quantitative?

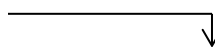
Qualitative: \_\_\_\_\_

\_\_\_\_\_

Quantitative: \_\_\_\_\_

\_\_\_\_\_

3. Solve the following. (show work after problem)



$$34^{\circ}\text{C} = \text{_____}^{\circ}\text{F}$$

$$45^{\circ}\text{C} = \text{_____}\text{K}$$

$$456\text{K} = \text{_____}^{\circ}\text{F}$$

4. Convert 36 ml into  $\text{cm}^3$ . (Show Work)

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5. Your assignment is to figure out which type of fertilizer works best on corn. You plant 4 kernels of corn in your raised garden and apply a different fertilizer to 3 of the kernels. You water each of kernels with the same amount of water and they are exposed to the same amount of sunlight. The data below is what you recorded.

Kernel #	Fertilizer Type	Amount of Sun (Hours)	Amount of water (Liters)	Final Plant Height (Meters)
A	None	12	2	2.1
B	Grow-More	12	2	2.0
C	Super-Gro	12	2	1.4
D	Sprout-More	12	2	1.9

- Identify the Independent Variable(s) \_\_\_\_\_
  - Identify the Dependent Variable(s) \_\_\_\_\_
  - Identify the Control(s) \_\_\_\_\_
  - Identify the Constant(s) \_\_\_\_\_
  - State a viable conclusion for this experiment: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
6. Is the word “hypothesis” being used in the scientific way or the everyday way in the following statement? Explain.
- My hypothesis is that as you increase the amount of water a plant gets, the more it will grow.  
 \_\_\_\_\_  
 \_\_\_\_\_

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## Section 2.2

7. Write down the Unit Conversions

\_\_\_\_\_

8. Fill in the missing info in the table.

Quantity	SI Base Unit Name	SI Base Unit Symbol
Mass		
Length		
	Kelvin	K
Time		
		Mol
	Ampere	
Luminous Intensity		

9. You win the trip of a lifetime to the ..... MOON! When you get there, what will happen to your mass and what will happen to your weight? (Assume you are instantly teleported to the moon)

Mass: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Weight: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

10. What is a derived unit? \_\_\_\_\_

a. Give an example of a derived unit: \_\_\_\_\_

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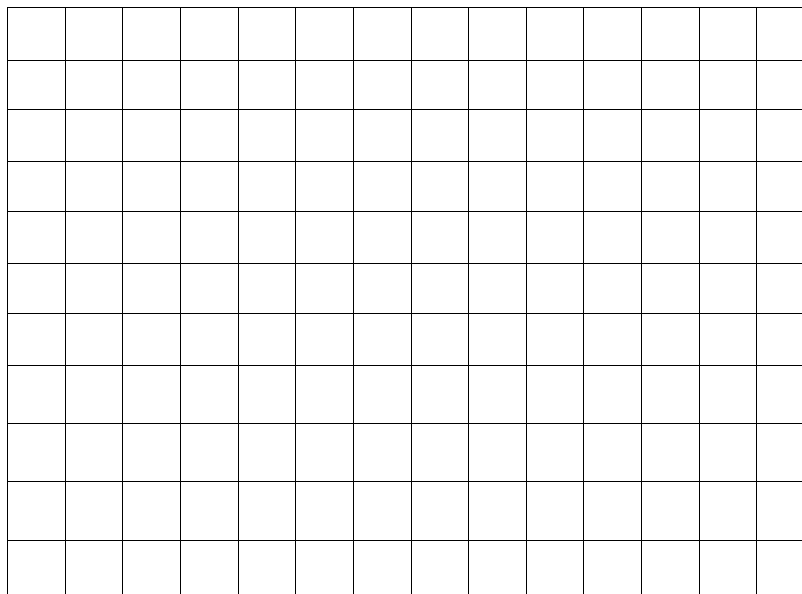
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11. The volume of a sample of "X" is 45.7 ml. If "X" has a mass of 25.3 g, what is the density of "X"? (Show Work)
12. The density of a substance is  $2.5 \text{ g/cm}^3$ . If the volume of this sample is 67 ml, what is the mass? (Show Work)
13. What is the mass of an object with a density of  $1.55 \text{ g/cm}^3$  and a volume of  $13 \text{ cm}^3$ ? (Show Work)
14. Identify the quantity each measurement represents. (i.e. 2 g represents mass)
- 1.55 m \_\_\_\_\_                      13 L \_\_\_\_\_
- $50 \text{ m}^2$  \_\_\_\_\_                      180 ms \_\_\_\_\_
15. Convert the following: (Show work and circle your final answer)
- 235.22 mg  $\rightarrow$  kg                      5.45 cm  $\rightarrow$  hm
- $5.244 \times 10^3 \text{ m}$   $\rightarrow$  mm                      685 m/s  $\rightarrow$  m/h
- 854 m/s  $\rightarrow$  km/h                      25 km/h  $\rightarrow$  m/ms

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16. Create a graph of the following data and use it to determine the mass of a  $7 \text{ cm}^3$  piece of copper.

Mass of Copper (g)	Volume of Copper ( $\text{cm}^3$ )	The mass of the copper is...
10	1.1	_____
30	3.33	
45	5	
90	10	



- a. Using the above information and your graph, determine the density of copper. Explain how you came up with this density.

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17. How many inches are there in 2 kilometers? (show ALL your conversions)

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365

MrG

Mr. Gunkelman

## Section 2.3

18. Explain how something can be precise and NOT accurate. Also, give an example of this phenomenon.
19. You throw 3 darts at a dart board and all three hit the bullseye. Your partner says, "Man, you sure were precise, too bad you weren't accurate". Explain what you must have done.
20. The accepted value for the density of "X" is  $5.69 \text{ g/cm}^3$ . You find the density of a sample of "X" to be  $5.87 \text{ g/cm}^3$ . What is your percent error? (show work) (1)
21. What is the mass of the sample from the above problem if it has a volume of  $6 \text{ cm}^3$ ? (show work)
22. You report a percent error of 1.6 %. If the accepted value was 122 grams, what was your experimental value? (show work)
23. You report a percent error of -2.4 %. What did you do incorrectly when calculating your percent error?



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24. Explain how some error or uncertainty always exists in any measurement.

25. How many sig figs in the following numbers?

0.045 \_\_\_\_\_      1230 \_\_\_\_\_      23.044 \_\_\_\_\_

123.02 \_\_\_\_\_      58.200 \_\_\_\_\_      85.360020 \_\_\_\_\_

0.00252 \_\_\_\_\_      0.000025025200 \_\_\_\_\_      150. \_\_\_\_\_

26. Solve the following.

$34.78 + 456.09 + 23 =$  \_\_\_\_\_       $789.009 - 234.0 =$  \_\_\_\_\_

$3.56 * 23.98 * 300 =$  \_\_\_\_\_       $947.88 / 23.1 =$  \_\_\_\_\_

$12.2 (5.2222 + 1.1) =$  \_\_\_\_\_       $13.1 + 5 * 6.99 =$  \_\_\_\_\_

27. Express the following in scientific notation:

123456.22 m \_\_\_\_\_      0.000456 cm \_\_\_\_\_

15000 m \_\_\_\_\_      162.500 mL \_\_\_\_\_

0.004658 L \_\_\_\_\_      1.25 m \_\_\_\_\_

14. Express the following in decimal form. (Reverse scientific method)

$1.254 \times 10^8$  cm \_\_\_\_\_       $8.225 \times 10^{-5}$  km \_\_\_\_\_

$5.698 \times 10^8$  m \_\_\_\_\_       $1.0 \times 10^{-1}$  L \_\_\_\_\_

28. Solve the following using scientific notation mathematical operations: Show work!!

$2.335 \times 10^8 + 2.55 \times 10^4 =$  \_\_\_\_\_

$(5.582 \times 10^{-4})(2.554 \times 10^3) =$  \_\_\_\_\_

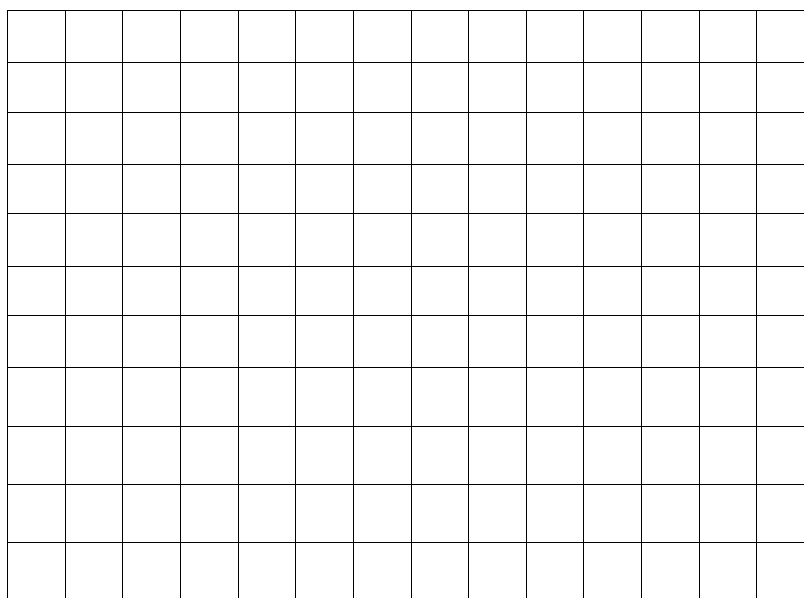
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29. You are given the following data, graph the data and answer the following questions.

Speed (m/s)	Distance (m)
3	9
10	30
15	45



a. Are speed and distance directly or inversely proportional? Explain how you know this.

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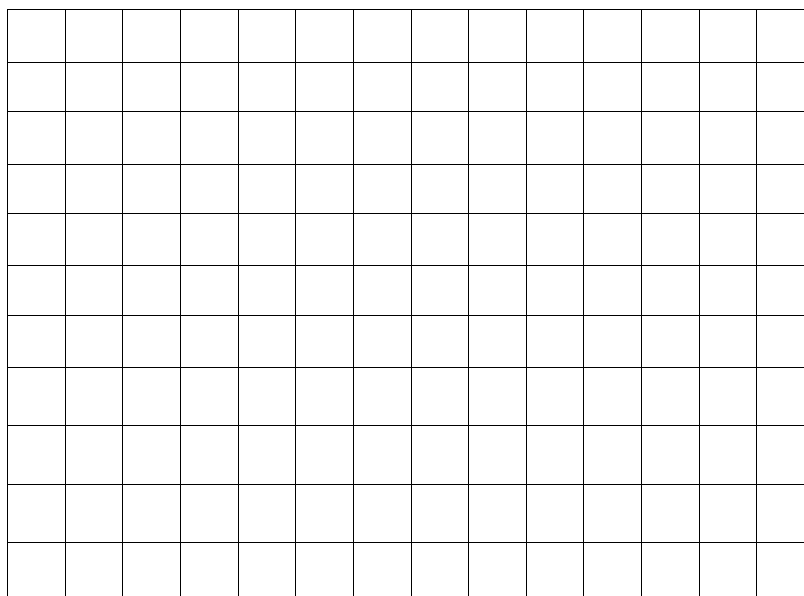
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30. You are given the following data, graph the data and answer the following questions.

Pressure (kPa)	Volume (cm <sup>3</sup> )
100	500
150	333
200	250
300	166
350	143



b. Are pressure and volume directly or inversely proportional? Explain how you know this.

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