

# PAP Chemistry Summer Assignment

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

PAP Chemistry is an indepth study of chemistry and it is necessary that you come to this course ready to work from Day 1. It will be very important for you to **read each and every chapter** in order to get the maximum benefit out of this course.

The following assignment will be reviewed in class beginning on the first week of school. I will take questions on any problems you may have had from this assignment on the first few days of class.

I tried to include links to helpful YouTube videos to watch but also, take the initiative, and search for your own videos to watch (Bozeman, CrashCourse and Professor Dave Explains are good video series I have used in class).

If you have any questions, please email me at [Adrienne.rodenberger@houstonisd.org](mailto:Adrienne.rodenberger@houstonisd.org) . Do not wait until the last minute to do these assignment as it will take a while to complete.

## I. Significant Figures

How many significant figures are in each of the following?

Reference video: <https://www.youtube.com/watch?v=7b60RZqut0U>

- 1) 1.92 mm
- 2) 0.030100 kJ
- 3)  $6.022 \times 10^{23}$  atoms
- 4) 460.00 L
- 5)  $0.00036 \text{ cm}^3$
- 6) 100
- 7) 1001
- 8) 0.001
- 9) 0.0101
- 10) 0.010100

Calculate the following to the correct number of significant figures.

Reference video 1: <https://www.youtube.com/watch?v=o5BmoMDJLRY> [multiplication and division]

Reference video 2: <https://www.youtube.com/watch?v=2eXC6s9X6Wc> [addition and subtraction]

Reference video 3: <https://www.youtube.com/watch?v=Ma4nDAOP6Gk> [counted quantities]

- |                                |                        |
|--------------------------------|------------------------|
| 1) $1.27 / 5.296$              | 2) $12.235 / 1.01$     |
| 3) $12.2 + 0.38$               | 4) $17.3 + 2.785$      |
| 5) $2.1 \times 3.21$           | 6) $200.1 \times 120$  |
| 7) $17.6 + 2.838 + 2.3 + 110.$ | 8) $3.28 (2.45 - 6.6)$ |

## II. Scientific Notation

Reverence video: <https://www.youtube.com/watch?v=Dme-G4rc6NI&t=328s>

Record the following in correct scientific notation:

- |                    |                          |
|--------------------|--------------------------|
| 1) 350,000,000 cal | 3) 0.0000000809 Å        |
| 2) 0.0000721 mol   | 4) 765,400,000,000 atoms |

Performing the following calculations and write the answers using scientific notation to correct significate figures.

Reference video: <https://www.youtube.com/watch?v=ciFOLirz4Js>

- |   |   |
|---|---|
| 1) $(5.3 \times 10^3) \times (2.0 \times 10^4)$ | 3) $(1.3 \times 10^4) \times (3.1 \times 10^4)$ |
| 2) $(8.4 \times 10^6) / (2.0 \times 10^4)$      | 4) $(8.8 \times 10^3) / (4.4 \times 10^8)$      |

### III. Metric & time Conversions

Use factor labeling method to convert the following: **Must show your work using dimensional analysis**

More practice to complete at the end of this document.

Reference video: <https://www.youtube.com/watch?v=1YgTiQ-ZIf0>

Equalities you MUST know. base to mili, base to kilo, base to nano, base to centi, base to micro, and time

1. 515 m = \_\_\_\_ nm (nanometers)
2. 200 mm (millimeter) = \_\_\_\_ meters
3. 325 hours = \_\_\_\_ seconds.
4. 200.0 centijoule (cJ) = \_\_\_\_ kilojoule (kJ)
5. 10 kilometers into meters
6. 15,050 milligrams into grams
7. 3,264 milliliters into liters
8. 9,674,444 grams into kilograms

*Below are some conversion factors used in the SI System, and which we will use in this class.*

<u>kilo- = 1000</u>	<u>centi- = 1/100</u>	<u>milli- = 1/1000</u>	<u>micro- = 1/1000000</u>	<u>nano- = 1/1000000000</u>
1 kg = 1000 g		1000 mg = 1 g	1 g = 1000000 µg	1 g = 1000000000 ng
1 km = 1000 m	100 cm = 1 m	1000 mm = 1 m	1 L = 1000000 µL	1 L = 1000000000 nL
1 kL = 1000 L		1000 mL = 1 L	1 m = 1000000 µm	1 m = 1000000000 nm

*Solve each of the following problems. Use dimensional analysis and always use units.*

Example: Determine the number of m in 1600 µm.

1. Set up dimensional analysis brackets
2. Start with what you know
3. Use the conversion factor to go from starting units (in the denominator) to the new units (in the numerator).
4. Multiply across the top and divide by the bottom.
5. Put answer with correct significant figure and usually scientific notation with units.

1600 µm	1 m	= 0.0000016 m or 1.6 x 10 <sup>-6</sup> m
	1000000000 µm	

1. Determine the number of mm in 1600 m.

2. Determine the number of m in 1600 mm.

3. Determine the number of mm in 14.3 cm.
4. How many seconds are in 4.3 years?
5. Convert 2875 ml to L.
6. Convert 5.2 cm of magnesium (Mg) ribbon to mm of Mg ribbon.
7. Convert 0.0049 g sulfur (S) to ng of S.
8. Convert 0.020 kg of tin (Sn) to mg of Sn.
9. Convert 150 mg of acetylsalicylic acid (aspirin) to g of aspirin.
10. Convert 2500 mL of hydrochloric acid (HCl) to L of HCl.
11. How many mL of water (H<sub>2</sub>O) will it take to fill a 2 L bottle that already contains 1.87 L of H<sub>2</sub>O?