

Homework #1 (Measuring and Units)

CHEM 11 (S 2016, LAC)

(Due Friday, February 5)

Note 1: You need to understand the metric prefixes we identified in class. Also you may need these facts: $1 \text{ u} = 1.660\,538\,921 \times 10^{-27} \text{ kg}$; $1 \text{ in} = 2.54 \text{ cm}$ (exactly); $1 \text{ kg} = 2.2046 \text{ lb}$; $1 \text{ mi} = 1.609 \text{ km}$; and $1 \text{ AU} = 0.149598 \text{ Gm}$.

Note 2: You must show your work; correct answers by themselves do not get credit. The conversion fraction approach described in class must be used wherever possible. Remember to apply significant digits to round your answers appropriately.

1. When a comet is 1.234 AU from the Sun, how far is this in mm?
2. The average distance an electron is from the nucleus of a hydrogen atom is 0.524 nm. What is its diameter in km?
3. Since 196.6 g of gold has 6.022×10^{23} atoms, what is the mass of one atom in atomic mass units (u)?
4. What is the volume of air in a room that is 3.165 m wide by 4.16 m long with a height of 2.605 m? Give your answer in m^3 and Mm^3 .
5. In the grocery store a package of rolled oats contains 480 g of oats. How many pounds is this?