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Name: Key
Hour: ____ Date: _____

Chemistry: *Unit 1 Review*

Directions: Complete the following questions using your notes and previous homework to help. Show all your work and include units, when necessary. Write in complete sentences, when necessary.

1. List three safety rules you feel are the most important rules for laboratory work.
   - Wear safety glasses
   - Use common sense
   - Obey safety contract
2. List three items of information you can find on an MSDS sheet.
   - Hazards
   - First Aid measures
   - Fire Fighting measures
3. Explain the difference between acute and chronic chemical exposure. Provide an example of each.
   Acute (short-term) show immediately - nose irritation.
   Chronic (long-term) Usually permanent - liver damage.
4. Describe each step in the scientific method.
   Question -
   Hypothesis -
   Experiment -
   Analize Data -
   Conclusion -
5. Compare and contrast qualitative and quantitative observations.
   Qualitative - Opinion
   Quantitative - Numerical
6. Provide three major differences between a scientific law and a scientific theory.
   Law = Statement / Theory = Explanation.
   No experiment req. / Requires experimentation
   Never obsolete / may become obsolete
   Observable Fact / may be strong or weak
7. Write the four important parts of a graph.
   - Axis Labels & Title
   - Units
   - Intervals
   - Data
8. Express in standard form.
   1. 5.2×10^{3} 5,200
   2. 9.65×10^{-4} 0.000965
   3. 8.5×10^{-2} 0.085

   Express in scientific notation.
   4. 780000 7.8×10^{5}
   5. 0.00000422 4.22×10^{-6}
   6. 10000000 1×10^{7}

9. Examine the following data and make a graph on a separate sheet of paper. (Last Page)

Plant Height (cm) (y)	Time (Weeks) (x)
0	0
0.7	1
1.3	2
2.5	3
3.0	4
3.7	5
4.4	6
5.1	7
5.8	8
6.6	9

How tall was the plant at 2.5 weeks? 7.5 weeks?

1.8 cm 5.3 cm

How tall will the plant be at 10 weeks?

7.5 cm (extrapolation)

How many weeks had passed when was the plant 4.0cm tall?

5.4 weeks (interpolation)

10. Use the exponent function on your calculator to compute the following.

1. $(4.1 \times 10^{23})(8.0 \times 10^{3})$ 3.3×10^{27}
2. $(3.6 \times 10^{4})(13)$ 4.7×10^{5}
3. $(4.0 \times 10^{-3})(145)$ 0.58
4. $(7.9 \times 10^{5})(3.1 \times 10^{-8})$ 2.4×10^{-2}
5. $(3.2 \times 10^{4}) / (6.8 \times 10^{3})$ 4.7
6. $(4.6 \times 10^{3}) / (9.8)$ 4.7×10^{2}
7. $(298) / (2.7 \times 10^{-2})$ 1.1×10^{4}
8. $(5.6 \times 10^{-9}) / (3.3 \times 10^{6})$ 1.7×10^{-15}

11. Complete the following calculations. Include units on your answers.

1. $\frac{(135\ km)}{(3.5\ h)}$ $3.9 \times 10^{1}\ \frac{km}{h}$
2. $(7.2\ cm)(4.1\ cm)$ $3.0 \times 10^{1}\ cm^2$
3. $\frac{(5.2\ kg)}{(0.7\ L)}$ $7\ \frac{kg}{L}$
4. $\frac{(9.7\ kg)}{(0.45\ m \times 0.55\ m \times 4.2\ m)}$ $9.3\ \frac{kg}{m^3}$
5. $0.42\ mm \times 0.97\ mm \times 0.51\ mm$ $2.1 \times 10^{-1}\ mm^3$
6. $\frac{(75\ kg)(5.0\ m)}{(2.5\ s)(6.0\ s)}$ $25\ \frac{kg \cdot m}{s^2}$

12. Complete the following conversions.

1. 254.3 mm to m

$$254.3\ mm \left| \frac{1\ m}{10^3\ mm} \right. = 0.2543\ m$$

2. 5.68mL to kL

$$5.68\ mL \left| \frac{L}{10^3\ mL} \right| \frac{1\ KL}{10^3\ L} = 5.68 \times 10^{-6}\ KL$$

3. How many watzits are needed for 96widgets to be used? (1system = 12 widgets = 48 watzits)

Counting number →

$$96\ widgets \left| \frac{48\ watzits}{12\ widgets} \right. = 384\ watzits$$

(Counting numbers - dont consider significant figures)

4. 0.952kg to g

$$0.952\ kg \left| \frac{10^3\ g}{1\ kg} \right. = 952\ g$$

5. $7.18\ kg/m^3$ to mg/cm^3

$$7.18\ \frac{kg}{m^3} \left| \frac{10^3\ g}{1\ kg} \right| \frac{10^3\ mg}{1\ g} \left| \frac{1^3\ m^3}{100^3\ cm^3} \right. = 7.18\ \frac{mg}{cm^3}$$

13. Explain the Law of Conservation of Mass.

The law of Conservation of Mass states that mass is neither created or destroyed. Therefore, the mass of the products will equal the mass of reactants in a chemical reaction or a physical process.