**Chemistry**

**Study Guide – Unit One**

1. For each of the following, underline the independent variable, circle the dependent variable, and put a square around any controlled variables
	* A study was done to find if different tire treads affect the braking distance of a car.
	* The amount of pollution produced by cars was measured for cars using gasoline containing different amounts of lead.
	* Four groups of rats are first massed and then fed identical diets except for the amount of vitamin A they receive. Each group gets a different amount. After 3 weeks on the diet, the rats’ masses are measured again to see if there has been a decrease.
2. In the following observations, circle the qualitative measurements:
	* 29 degrees Celsius
	* Water rose a bit
	* The solution turned pink
	* 37.5 mL
3. Write the following numbers in scientific notation, or as normal numbers.
	* 0.00384
	* 38,000
	* 1.69x103
	* 8.03X10-5
4. A liquid has a mass of 2.50 grams and a volume of 1.93 mL.
	* What is it’s density?
	* Will it sink or float on water?
5. In the space to the right, draw a scenario of
	* Both accurate and precise
	* Precise but not accurate
	* Neither accurate nor precise
6. Make the following metric conversions:
	* 390 km → m
	* 0.05 cg → mg
	* 1.49 mL→ L
7. Count the number of significant figures in the following values:
	* 130
	* 13.02
	* 0.0035
	* 0.00890

1. Carry out the following calculations to the correct number of significant figures.
	* 15.9 + 2.703
	* 30 x 4.5
	* 16.0 – 0.07
	* 25 / 38.9
2. Read the following pieces of lab equipment with the correct number of valid digits:

  
3. Write the SI units for the following:
	* Temperature
	* Mass
	* Length
	* Volume
	* Time
4. Describe the difference between chemical and physical properties in your own words.

1. Which of the following are chemical changes:
	* Rusting
	* Changing shape
	* Melting
	* Reacting with an acid
	* Spoiling
	* Condensing
2. Write two indicators that a chemical reaction has taken place:
3. What physical property does distillation use to separate mixtures?
4. What physical property does filtration use to separate mixtures?
5. Other things you should know:
	* Know the parts of the scientific method.
	* Know the difference between heterogeneous and homogeneous mixtures.
	* Be able to describe pure substances, elements, mixtures, and compounds.