Honors Physical Science
Matter and Methods of Measurement Test Review

1. **What are the standard SI (metric) units for measuring the following:**
   a. **mass** ***kilograms***
   b. **volume** ***liters***
   c. **length** ***meters***
   d. **time** ***seconds***
   e. **temperature** ***Celsius degrees***
2. **What are the metric prefixes? What power of 10 does each prefix represent?**
   tera 10^{12}
   giga 10^{9}
   mega 10^{6}
   kilo 10^{3}
   hecto 10^{2}
   deka 10^{1}
   base 10^{0}
   deci 10^{-1}
   centi 10^{-2}
   milli 10^{-3}
   micro 10^{-6}
   nano 10^{-9}
   pico 10^{-12}
   femto 10^{-15}
   atto 10^{-18}
3. **Convert the following metric units:**
   a. **400 Kg = ___*400,000*_____ g**
   b. **0.005 Hm= __*50*_____ cm**
   c. **50.5 cm= ___*5.05*_____ dm**
   d. **400 ml = ____*0.4*_____ L**
   e. **0.0042 Dg = __*42*_____ mg**
   f. **4.5 X 10^{-5} Ml = _____*45*____ L**
   g. **5.66 cg = _____*56600*____ μg**
   h. **6.66 X 10^{8} pm = _____*6.66 X 10^{-6}*___ Hm**
4. **How many variables should be altered in an experiment?** ***one***
5. **What are the two types of variables?** *independent and dependent*
6. **What part of the experiment is kept constant?** *controls*
7. **Which types of observation is used when measuring objects?** *quantitative*
8. ***The color of the residue was black*** **is considered what type of observation?** ***qualitative***
9. **Which part of the scientific method should be in an "if, then" statement?** ***hypothesis***
10. ***"If you are called to the office, then you are probably in trouble based on my past experience,"*** **would be considered more of a hypothesis or an inference? Why?** ***inference, because of prior experience***

11. **What must be done in order for a conclusion to be accepted as a theory?** ***the conclusion must be retested and published***
12. **Which axis is the independent variable plotted on? the dependent variable?** ***X; Y***
13. **How is range determined on a graph?** *subtract the lowest value from the highest value*
14. **How is the scale of an axis on a graph determined?** *highest value/number of lines available*
15. **Which is located between points already plotted on the graph: interpolated points or extrapolated points?** ***Interpolated***
16. **What type of graph would be appropriate for the following scenarios:**
    a. **The change in temperature as salt is added to boiling water.** ***Line***
    b. **The percentages of students who prefer cheese pizza to students who prefer pepperoni pizza.** ***Pie***
    c. **The amount of rainfall of the year by month.** ***bar***
17. **Define mass. How is mass different from weight?** ***the amount of matter in a object; weight includes gravity***
18. **Define volume. What two pieces of equipment can be used to determine volume?** ***the amount of space an object takes up; measuring with a meter stick/ruler or a graduated cylinder***
19. **What causes a meniscus?** *attraction of the liquid to the sides of a glass container*
20. **What is the boiling point and freezing point of the following:**
    a. **Celsius** ***100 and 0***
    b. **Fahrenheit** ***212 and 32***
    c. **Kelvin** ***373 and 273***
21. **What is the unit of temperature?** ***degree***
22. **What is the definition of matter?** ***anything that has mass and takes up space***
23. **What is the formula for density?** *density = mass/volume*
24. **Complete the following density problems:**
    a. **What is the volume of a block of lead with a mass of 282.5 g and a density of 11.3 g/cm^3?** ***25.0 cm^3***
    b. **What is the density of a substance with a mass of 360 grams and a volume of 7.**5 ml? *48 ml*
    c. **What is the mass of an object that measures 15 cm X 12 cm X 2 cm and has a density of 7.83 g/cm^3?** ***2818.8 cm^3 ~ 2800 cm^3***

25. **What is the scientific method?** ***series of steps used to solve a problem***
26. **What are the steps in the scientific method?** *State the problem, research the problem, make a hypothesis, conduct an experiment, record/analyze data, make a conclusion, report findings to others*
27. **A student would like to determine which type of dog food will help his dog gain weight the quickest. He looks at several brands. He determines that brand X will help his dog gain the most weight in the shortest amount of time because it contains more carbohydrates. He tests 3 brands over several weeks. At the completion of his experiment, he finds that brand X is the best for helping his dog gain weight.**

a. **What is the problem in this story?** ***which type of dog food will cause the quickest weight gain***

b. **What is the hypothesis?** *brand X will be the most effective*

c. **What is the independent variable?** *the type of dog food*

d. **What is the dependent variable?** *the amount of weight gained over a period of time*

e. **What do you think some controls could be?** *the dog, the amount of food given, the time each weight gain was measured, the flavor of the dog food, the time of the day the dog was fed*