

Characteristics of Chemistry-Regular-Test Review

1. Review the following sets of notes for the content questions:

- a. lab safety and equipment rules
- b. Scientific method/graphing
- c. Measurement in science
- d. Scientific notation/significant figures
- e. Metric conversion
- f. English to metric conversion
- g. Accuracy and precision

2. Read the following paragraph and answer the questions:

Coach Howard wanted to build muscle in his advanced weight training class. Coach Durham told him of a supplement that really showed results in his classes when he taught weight training. It was called Brand X. Coach Durham gave Coach Howard a flyer explaining the benefits. Coach Howard wanted to see if the supplement was effective. If Coach Durham found success with the supplement with his class, then Coach Howard felt like it would also help his class gain muscle. He gave $\frac{1}{2}$ of his class Brand X muscle supplement and the other $\frac{1}{2}$ of his class a fake pill that looked like the Brand X supplement for 1 month. During the month, he recorded the amount weight the students could max out on the bench once a week. He found that the students who took the Brand X supplement doubled their max bench lift while the students who did not receive the supplement only slightly improved. He thanked Coach Durham for the suggestion and now implements the Brand X supplement with his class.

- a. What is the problem? *Coach Howard wanted his weight lifters to build muscle*
- b. What is the independent variable? *The addition of the Brand X supplement*
- c. What is the dependent variable? *The amount of weight the lifters could lift*
- d. What is the control? *The lifters who did not receive the supplement*
- e. What part of the paragraph represents the “research the problem” step of the scientific method? *The pamphlet Coach Durham gave Coach Howard on the supplement*
- f. What is the hypothesis? *If Coach Durham found success with the supplement with his class, then Coach Howard felt like it would also help his class gain muscle.*
- g. How could Coach Howard make his findings turn into a theory? *Have other coaches test the supplement as well*

3. Give the best graph to use to represent the following scenarios:

- a. The number of students who prefer coke to pepsi products. *Circle/pie*
- b. The amount of growth in meal worms based on the amount of oatmeal they receive. *Line*
- c. The type of candy bar students in Mrs. Smith’s chemistry class prefer. *Bar*

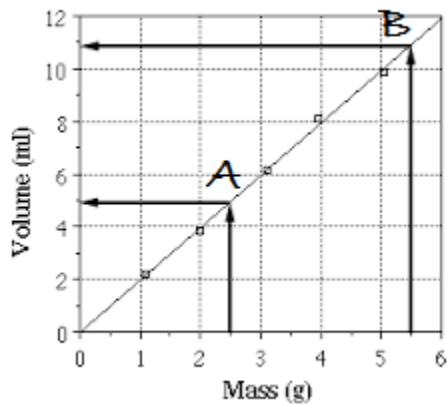
4. Using the data in the data table, determine the following:
 - a. Independent variable *amount of hours in the sunlight per day*
 - b. Dependent variable *growth of corn plant in cm*
 - c. Title of the graph *The effect of time in the sunlight on Corn Plant Growth*
 - d. Type of graph *line graph*
 - e. Scale of X axis if the number of lines available is 10 $10 \text{ lines}/5 \text{ hours} = 2$
 - f. Scale of y axis if the number of lines available is 10 $10 \text{ lines}/26 \text{ cm} = .38 \sim .5 \text{ cm}$

Amount of Hours in the Sunlight per day	Growth of Corn Plant in Cm
1 hour	10 cm
2 hours	15 cm
3 hours	22 cm
4 hours	24 cm
5 hours	26 cm

5. On the graph below, which point is interpolated and which point is extrapolated?

A

B



6. How many sig figs are there in the following:

- a. 172.59 5
- b. 2000 1
- c. 2000.0 5
- d. 0.00056 2
- e. 0.000560 3
- f. 1005.00 6
- g. 1005 4
- h. 0.0050 2

- i. 6.3×10^{-5} 2
 j. 0.002×10^{-2} 1
7. Convert the following from standard notation to scientific notation
- a. 98,000,000 9.8×10^7
 b. 0.00000000322 3.22×10^{-9}
 c. 902,000 9.02×10^5
 d. 0.0000000000044 4.4×10^{-12}
8. Convert the following from scientific notation to standard notation
- a. 3.629×10^{10} 36,290,000,000
 b. 7.04×10^{-6} 0.00000704
 c. 9.5×10^8 950,000,000
 d. 1.41×10^{-9} 0.00000000141
9. What is the density of an unknown metal with a mass of 36 grams and a volume of 25 ml?

$$36 \text{ g} / 25 \text{ ml} = 1.4 \text{ g/ml}$$

10. What is the mass of aluminum (density is 2.7 g/ml) if when 5 aluminum pieces are dropped into a graduated cylinder that contains 50 ml of water causes the water level to rise to 55 ml?
- $$55 \text{ ml} - 50. \text{ ml} = 5.0 \text{ ml volume of aluminum} \quad 2.7 \text{ g/ml} \times 5.0 \text{ ml} = 13.5 \sim 14 \text{ g/ml}$$
11. Dan was asked to find the mass of rubber stopper. He massed the rubber stopper three times and determined the masses from each trial to be (trial 1) 5.0 grams, (trial 2) 5.2 grams, and (trial 3) 5.1 grams. The teacher told him the mass should be 5.15 grams. Find the Ea, Er, and Da for the massing.

$$Ea = [5.15 \text{ g} - 5.0 \text{ g}] = 0.15 \text{ g}$$

$$Er = 0.15 \text{ g} / 5.15 \times 100 = 2.9\%$$

$$Da = [5.0 - 5.1] = 0.1$$

12. Convert the following using dimensional analysis

- a. 600 mg = _____ Kg
 b. $0.210 \text{ m}^3 =$ _____ cm^3
 c. 400,000 ml = _____ Hl
 d. 42.5 Hg = _____ pg
 e. 46.7 km/hr = _____ cm/sec
 f. 2.5×10^8 femtometers = _____ meters
 g. 0.00256 Dg = _____ dg
 h. 500 minutes = _____ hours
 i. 450 miles = _____ ft (use your chart)
 j. 3 quarts = _____ liters (use your chart)

$$a. \frac{600 \text{ mg}}{1} \times \frac{1 \text{ kg}}{10^6 \text{ mg}} = 0.0006 \text{ kg}$$

$$b. \frac{0.210 \text{ m}^3}{1 \text{ m}^3} \times \frac{10^6 \text{ cm}^3}{(10^2 \text{ cm})^3} = 210,000 \text{ cm}^3$$

$$c. \frac{400,000 \text{ ml}}{1} \times \frac{1 \text{ Hl}}{10^5 \text{ ml}} = 4 \text{ Hl}$$

$$d. \frac{42.5 \text{ Hg}}{1} \times \frac{10^{14} \text{ pg}}{1 \text{ Hg}} = 4.25 \times 10^{15} \text{ pg}$$

$$e. \frac{46.7 \text{ km}}{\text{Hr}} \times \frac{10^5 \text{ cm}}{1 \text{ km}} \times \frac{1 \text{ hr}}{3600 \text{ sec}} = 1297.22222 \text{ cm/sec} \sim 1300. \text{ Cm/sec}$$

$$f. \frac{2.5 \times 10^8 \text{ fm}}{1} \times \frac{1 \text{ m}}{10^{15} \text{ fm}} = 2.5 \times 10^{-7} \text{ m}$$

$$g. \frac{0.00256 \text{ Dg}}{1} \times \frac{10^2 \text{ dg}}{1 \text{ Dg}} = .256 \text{ dg}$$

$$h. \frac{500 \text{ min}}{1} \times \frac{1 \text{ hr}}{60 \text{ min}} = 8.3 \sim 8 \text{ hours}$$

$$i. \frac{450 \text{ miles}}{1} \times \frac{5280 \text{ ft}}{1 \text{ mile}} = 237600 \text{ ft}$$

$$j. \frac{3 \text{ quarts}}{1} \times \frac{1 \text{ gallon}}{4 \text{ quarts}} \times \frac{3.78541176 \text{ liter}}{1 \text{ gallon}} = 2.84 \sim 3 \text{ liters}$$

13. Complete the following calculations basing your answer on the correct number of sig figs or decimal places.

a. $4.56 \times 7.89 = 35.9784 \sim 36.0$

b. $10.3/2.0 = 5.15 \sim 5.2$

c. $1.2 + 6.3 = 7.5$

d. $10.98 - 3.2 = 7.78 \sim 7.8$