

- 1) List three examples of a QUALITATIVE piece of data?

the red barn The music is loud
the socks are smelly

- 2) List three examples of a QUANTITATIVE piece of data?

5.89 cm long 18 feet high 25 students

- 3) What type of process is represented by the scientific method? *iterative*

- 4) What is the S.I. standard for length? *meter*

- 5) What is the S.I. standard for mass? *kilogram*

- 6) What is the S.I. standard for volume? *Liter*

- 7) What is the S.I. standard for temperature? *Kelvin*

- 8) What is the S.I. standard for time? *second*

- 9) The S.I. prefix that relates to the power of ten, 10^{-6} is: *micro*

- 10) The S.I. prefix that relates to the power of ten, 10^6 is: *Mega*

- 11) Giga represents what power of 10 in the metric system? 10^9

- 12) Nano represents what power of 10 in the metric system? 10^{-9}

- 13) What abbreviation is used for the metric prefix micro? *μ*

- 14) What abbreviation is used for the metric prefix hecto? *h*

- 15) Which of the following S.I. units would be best used to express the mass of a large textbook?

A. milligram

B. liter

C. kilogram

- 16) One milliliter is exactly equal to one cubic centimeter.

- 17) What is a common unit used to express density?

g/mL or g/cm³

18) Define CHEMISTRY in your own words.

the study of matter and the changes that occur to matter

19) Define MATTER in your own words.

matter is anything that has mass and volume

20) What is a MEASUREMENT?

a quantitative observation with a number and a unit

21) Explain how the DEPENDENT VARIABLE and the INDEPENDENT VARIABLE are related in an experiment.

Independent variable is intentionally changed and the dependent variable is what is measured to determine what that change does.

22) Which type of data, QUALITATIVE or QUANTITATIVE, tends to be more convincing and WHY?

Quantitative because that contains numbers and numbers are less likely to be argued than sensory data

23) What is SPECIFIC GRAVITY?

the ratio of a liquids density to the density of water

24) Does specific gravity have units? Explain why or why not?

No, because it is a ratio the units cancel out.

25) What is DIMENSIONAL ANALYSIS ?

a problem solving system using unit cancellation to set up the problems.

26) Why is scientific notation used?

to express really large or really small numbers in a more compact way.

27) Why are significant figures (significant digits) used in science class, but not usually in math class?

Science class is dealing with measurements that have a certain level of accuracy... math class works with pure numbers

28) Why is a control necessary in an experiment?

A control is necessary to see unexpected outcomes in an experiment.

Count the number of Significant Figures:

29) How many significant figures are in the number 1.0089?

5

30) How many significant figures are in the number 0.0034?

2

31) How many significant figures are in the number 1.800

4

32) How many significant figures are in the number 0.0300900?

6

33) How many significant figures are in the number 10000?

1

34) How many significant figures are in the number 1.00040000

9

Round the following answers to the correct number of Significant Figures.

35) $45.7 + 33.234 + 89.003 = 167.937$

167.9

36) $79.09 \times 65.10 = 5148.759$

5149

37) $5.73 + 33.234 + 89.003 = 127.967$

127.97

38) $79.09 \div 81.31 = 0.9726970852$

0.9727

Chemistry CP
Chapter 2 Test

Solve the following conversion problems. BE SURE TO INCLUDE UNITS!!!

$$^{\circ}\text{F} = (1.8 \times ^{\circ}\text{C}) + 32$$

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32)/1.8$$

$$\text{K} = ^{\circ}\text{C} + 273$$

$$^{\circ}\text{C} = \text{K} - 273$$

39) Convert -78 degrees Fahrenheit to Kelvin

$$(-78 - 32) \div 1.8 = -61.111^{\circ}\text{C} + 273 = 211.8\text{K} = 210\text{K}$$

40) Convert 1853 degrees Kelvin to Fahrenheit

$$1853 - 273 = 1580^{\circ}\text{C} \quad (1.8 \times 1580) + 32 = 2876^{\circ}\text{F}$$

41) Convert 78 degrees Fahrenheit to Celsius

$$(78 - 32) \div 1.8 = 25.555^{\circ}\text{C} = 26^{\circ}\text{C}$$

42) Convert -45 degrees Celsius to Fahrenheit

$$(1.8 \times -45) + 32 = -49^{\circ}\text{F}$$

43) Convert 35 degrees Celsius to Kelvin.

$$35 + 273 = 308\text{K}$$

44) Convert 348 degrees Kelvin to Celsius

$$348 - 273 = 75^{\circ}\text{C}$$

45) Change 1.56×10^{-16} into ordinary decimal form

$$0.000000000000000156$$

46) Change 3.89×10^{13} into ordinary decimal form

$$389000000000000$$

47) Change 0.0000489786 into scientific notation

$$4.89786 \times 10^{-5}$$

48) Change 345,580,000 into scientific notation

$$3.4558 \times 10^8$$

49) Convert 387 centimeters to kilometers $1 \times 10^{-2}\text{m} = 1\text{cm}$, $1 \times 10^3\text{m} = 1\text{km}$

$$\frac{387\text{cm}}{1\text{cm}} \times \frac{1 \times 10^{-2}\text{m}}{1 \times 10^{-2}\text{m}} = 3.87\text{m} \quad \frac{3.87\text{m}}{1 \times 10^3\text{m}} \times \frac{1 \times 10^3\text{m}}{1 \times 10^3\text{m}} = 0.00387\text{km}$$

50) Convert 34.8 liters to milliliters $1 \times 10^{-3}\text{L} = 1\text{mL}$

$$\frac{34.8\text{L}}{1 \times 10^{-3}\text{L}} \times \frac{1 \times 10^{-3}\text{L}}{1 \times 10^{-3}\text{L}} = 34800\text{mL}$$

51) Convert 29.7 oz to grams (16 oz = 454 grams)

$$\frac{29.7\text{oz}}{16\text{oz}} \times \frac{454\text{g}}{16\text{oz}} = 842.7375 = 843\text{g}$$

52) Convert 17.6 cm to inches. (2.54 cm = 1 inch)

$$\frac{17.6 \text{ cm}}{2.54 \text{ cm}} \times 1 \text{ in} = 6.929133858 = 6.93 \text{ in}$$

53) Convert 3587 nanometers to hectometers $1 \times 10^{-9} \text{ m} = 1 \text{ nm}$; $1 \times 10^2 \text{ m} = 1 \text{ hm}$

$$\frac{3587 \text{ nm}}{1 \text{ nm}} \times \frac{1 \times 10^{-9} \text{ m}}{1 \times 10^2 \text{ m}} = 0.0000003587 \text{ m} = 0.0000003587 \text{ hm}$$

54) Convert 34.8 micrograms to grams $1 \times 10^{-6} \text{ g} = 1 \mu\text{g}$

$$\frac{34.8 \mu\text{g}}{1 \mu\text{g}} \times 1 \times 10^{-6} \text{ g} = 0.0000348 \text{ g}$$

$$3.587 \times 10^{-8} \text{ hm}$$

55) Convert 429.7 grams to oz (16 oz = 454 grams)

$$\frac{429.7 \text{ g}}{454 \text{ g}} \times 16 \text{ oz} = 15.14361233 = 15.14 \text{ oz}$$

56) Convert 467 picometers to decimeters. $1 \times 10^{-12} \text{ m} = 1 \text{ pm}$; $1 \times 10^{-1} \text{ m} = 1 \text{ dm}$

$$\frac{467 \text{ pm}}{1 \text{ pm}} \times \frac{1 \times 10^{-12} \text{ m}}{1 \times 10^{-1} \text{ m}} = 4.67 \times 10^{-10} \text{ m} = 4.67 \times 10^{-9} \text{ dm}$$

57) Convert 197.6 inches to cm. (2.54 cm = 1 inch)

$$\frac{197.6 \text{ in}}{1 \text{ in}} \times 2.54 \text{ cm} = 501.904 = 501.9 \text{ cm}$$

58) Convert 0.890 liters to teraliters $1 \times 10^{12} \text{ L} = 1 \text{ TL}$

$$\frac{0.890 \text{ L}}{1 \times 10^{12} \text{ L}} = 8.90 \times 10^{-13} \text{ TL}$$

59) Convert 0.360 yards to feet. (3 feet = 1 yard)

$$\frac{0.360 \text{ yd}}{1 \text{ yd}} \times 3 \text{ ft} = 1.08 \text{ ft.}$$

Density problems: BE SURE TO INCLUDE UNITS!!!

60) If a 150. gram sample has a volume of 15.3 mL, What is the density of the substance?

$$D = \frac{m}{V} = \frac{150 \text{ g}}{15.3 \text{ mL}} = 9.80392 = 9.80 \text{ g/mL}$$

61) The density of copper is 8.92 g/mL, if my copper sample has a volume of 14.3 mL what is the mass of this sample?

$$D \times V = m$$

$$8.92 \text{ g/mL} \times 14.3 \text{ mL} = 127.556$$

$$128 \text{ g}$$

62) What volume would 21.0 grams of mercury occupy (density of mercury 13.6 g/mL)?

$$V = \frac{m}{D} \quad \frac{21.0g}{13.6g/mL} = 1.544117647 = 1.54mL$$

63) If a student works with a sample in lab and records the following data: 5.18 mL, 45.8 grams. What is the density of the substance?

$$D = \frac{m}{V} \quad \frac{45.8g}{5.18mL} = 8.841698842 = 8.84g/mL$$

64) The density of silver is 10.5 g/mL, if my silver sample has a mass of 155 grams, how much space does the sample occupy?

$$V = \frac{m}{D} \quad \frac{155g}{10.5g/mL} = 14.76190476 = 14.8mL$$

65) If a mercury thermometer holds 2.78 mL of mercury, what is the weight of the mercury contained in a thermometer? (density of mercury 13.6 g/mL)

$$D \times V = m \quad 13.6g/mL \times 2.78mL = 37.808 = 37.8g$$

Use DENSITY to determine the identity of the sample. Circle your answer!

66) Identify the following substance based on its density. A sample of the substance has a mass of 23.5 grams and a volume of 2.24 mL. The possible substances are:

Aluminum- density 2.70 g/mL
Iron- density 7.87 g/mL
Silver- density 10.5 g/mL
Lead- density 11.34 g/mL

$$D = \frac{m}{V} \quad \frac{23.5g}{2.24mL} = 10.4910g/mL$$

67) Identify the following substance based on its density. A student recorded the following information about an unknown sample in lab: 155 ml, 1220 grams. The possible substances are:

Aluminum- density 2.70 g/mL
Iron- density 7.87 g/mL
Silver- density 10.5 g/mL
Lead- density 11.34 g/mL

$$D = \frac{m}{V} \quad \frac{1220g}{155mL} = 7.8709g/mL$$

F	68) I go to the library and look up information on germs and how to eliminate them from surfaces.
C	69) Name brand disinfectants such as Lysol will remove germs from surfaces better than non name brand products.
A	70) I look at my data and see if there are any unexpected results, or if there is any information that may have been missed.
G	71) Using Lysol, and two generic brands A and B, I clean surfaces such as door knobs and desks and then check for germ growth by using swabs and growth media in petri dishes. I compare this to surfaces of the same types that were not cleaned.
E	72) I tell Mr. DeAntonio that the school can save money by using the generic brand B cleaner rather than Lysol cleaner.
D	73) How can I remove germs from the surfaces in school that I touch?
B	74) According to my data, the generic brand B cleaner removed more germs than the other two cleaners and created surfaces that had 75% fewer germs than those surfaces that were not cleaned.

This is worth 8 points, ONE POINT EACH!

- A. Analyze Data
- B. Conclusion
- C. Hypothesis
- D. Question
- E. Report
- F. Research
- G. Test w/ an Experiment

75) What is the dependent variable in the above experiment?

Number of germs growing on petri dish

76) What is the independent variable in the above experiment?

different types of cleaners - Lysol, Brand A, Brand B

77) What is the control in the above experiment?

Surfaces not cleaned at all

78) Did this person use quantitative or qualitative data in their conclusion?

Quantitative - 75% fewer germs
is a number!