

TEST 1

Name Helen Wallen

Science, Chemistry, & You

$$\frac{-10\frac{1}{2} + 4}{52} =$$

88% BT

Great Job!

9/10/13

Page 1

Multiple Choice

Read each question entirely before choosing your answer; only one choice is correct. After making your choice, write the corresponding letter in the blank provided.

- C 1. Who revolutionized the scientific community by doing experiments and arguing that inductive reasoning was the right method of approaching a problem?
- A. Wollaston
B. Paracelsus
C. Galileo
D. Boyle
- D 2. What is a scientific hypothesis?
- A. a scientific law
B. a previously established fact
C. a general, inductive approach to discovering
D. a general, unproven statement derived from observations
- B 3. Which one of the following statements about theories is *incorrect*?
- A. They are supported by observations.
B. They are above question and should be accepted as stated.
C. They suggest new avenues of research.
D. They help to organize a body of data.
- A 4. Which of the following gives the proper order for the steps in the scientific method?
- A. recognizing a problem, making observations, proposing a hypothesis, organizing and analyzing data, framing a theory, and verifying the theory
B. making observations, proposing a hypothesis, recognizing a problem, organizing and analyzing data, framing a theory, and verifying the theory
C. framing a theory, making observations, proposing a hypothesis, recognizing a problem, organizing and analyzing data, and verifying the theory
D. recognizing a problem, framing a theory, proposing a hypothesis, making observations, organizing and analyzing data, and verifying the theory
- A 5. Which of the following metals was not known in Old Testament times?
- A. aluminum
B. copper
C. gold
D. iron
- D 6. Which of the following is not a contribution made to modern chemistry by alchemists?
- A. distillation techniques
B. glassware design
C. experimental approach
D. definition of an element
- A 7. Who discovered the element oxygen?
- A. Priestley
B. Lavoisier
C. Boyle
D. Wohler
- C 8. Which branch of chemistry studies compounds containing carbon?
- A. biochemistry
B. inorganic chemistry
C. organic chemistry
D. nuclear chemistry

TEST 1

Matching

Match the letter of the answer with the appropriate clue by writing the letter in the blank. Answers will be used only once.

- ~~A.~~ Francis Bacon
- ~~B.~~ Robert Boyle
- ~~C.~~ Antoine Lavoisier
- ~~D.~~ Philippus Paracelsus
- ~~E.~~ Joseph Priestley
- ~~F.~~ Benjamin Rush
- ~~G.~~ Friedrich Wohler
- ~~H.~~ William Wollaston
- I. Galileo Galilei
- ~~J.~~ Jabir ibn-Hayyan (Geber)

- H 21. discovered palladium and rhodium
- B 22. first proposed that elements are substances that cannot be chemically decomposed into simpler substances
- AI 23. pronounced a heretic, imprisoned, and exiled by the Roman Catholic Church for his belief that the sun was the center of the solar system
- IA 24. praised the alchemists for their contribution to the experimental approach
- D 25. proposed the use of chemicals to treat disease
- J 26. one of the first major alchemists in Europe; wrote many books about chemical techniques
- F 27. first professor of chemistry in the United States
- E 28. discovered a gas in which substances easily burn by heating mercuric calx
- G 29. synthesized urea from two inorganic compounds
- C 30. proposed that substances gain something from the atmosphere when they burn

TEST 1

45. The word *chemia*, from which the word chemistry is derived, first appeared during the time of Christ in ancient writings from which city? Europens Alexandria
46. What is the mysterious substance that early scientists thought was allowed to escape during burning? The substance is called oxygen; phlogiston
47. List five occupations in which knowledge of chemistry is important. ① can make weapons, ② make jewelry, ③ Diagnose, ④ can treat diseases, ⑤ Experiment for new things.
48. What term is given to a chemical that does not easily react with another chemical? Inert
49. Early pharmacists prepared and sold a wide variety of chemicals and herbs. What were the pharmacists who sold these goods called? He's name is philippus Paracelus.
50. What is the name of the Iron Age people who dominated the Israelites during the time of Saul? It is called Iron mercuric
Philistines

Essay

Choose one of the following questions. In the space provided, answer the question, using complete sentences.

51. Many students are able to achieve good grades by just memorizing facts. Why shouldn't students be satisfied with just memorizing facts?

The students want to know more than just memorizing facts. They want to be able to think how to solve, and experiment.

52. How would a knowledge of chemistry help you in the occupation in which you are most interested?

...

Safety Quiz

-3 85% B Good Job!

True or False.

F 1. It is unnecessary to report minor accidents and injuries to your teacher.T 2. Do not eat or drink food items while performing a laboratory exercise.T 3. Always wear safety glasses or goggles when performing experiments.F 4. Wear clothing with loose sleeves.F 5. Return unused chemicals to their bottles.X F 6. If you put a lid down, put it down so the inside surface touches the table.*You don't want the lid to contaminate the contents of the bottle.*F 7. You can drink from the beakers, flasks, and test tubes as long as you have rinsed them first.T 8. When smelling a substance, gently waft its vapor toward you.T 9. Always add acid to water slowly when diluting acid solutions. Never add water to an acid.F 10. It is okay to leave a heat source unattended for a short period of time.F 11. When heating substances in a test tube, point the mouth of the tube towards your face or your partner's face.X F 12. If you spill volatile, flammable, or toxic chemicals on the table or floor, clean the area with soap and water.F 13. If you accidentally swallow a chemical, you should induce vomiting.F 14. If your lab partner is on fire, you should use the fire extinguisher on them.

Short Answer.

15. If you spill a chemical on a small portion of your body, what should you do?

*body ←
portion of you**You need the cold water to run on the small*

16. If you spill an acid on your skin, what can you rinse the area with to neutralize the acid?

*sodium bicarbonate solution.
The part will you spill the acid.*

17. If a chemical splashes in your eyes, what should you do?

rinse with the water. Report to your teacher

18. What should you do if there is a small fire? a big fire?

*The big fire you need to roll on the ground. — fire extinguish**✓ Small fire you need a cloth and put the fire out.*

Quiz 3AB

-10+2 = 92% A - Great Job!

1-34. Fill in the following table:

tera	<i>giga</i>	mega	kilo	hecto	<i>deka</i>		deci	centi	milli	micro	nano	pico
T	G	M	K	h	da		d	c	m	μ	n	P
trillion	billion	million	thousand	<i>hundred</i>	<i>ten</i>		tenth	hundredth	thousandth	millionth	billionth	trillionth
10^{12}	10^9	10^6	10^3	10^2	10^1		10^{-1}	10^{-2}	10^{-3}	10^{-6}	10^{-9}	10^{-12}

Convert the following units (use proper sig figs):

- 1.1005 35. 11.005 mJ to cJ 2.15×10^3 36. 0.0215 kg to cg
- 56.7 37. 56,700 μ s to ms 5.60×10^6 38. 5.60 km to m *m, not mm*
- 792 39. 0.000792 TL to ML 1.2×10^4 40. 1.2×10^{-6} GL to cL

Determine the number of significant digits in each of the following:

- 8 41. 8002.0500 4 2 42. 5.001 (-2)
- 4 43. 12.35 5 44. 43,670.
- 2 45. 440 2 46. 0.0049
- 3 4 47. 0.0300 (-2) 1 48. 8
- 4 49. 4.500×10^{-3} 2 50. 0.0013×10^6

Convert into decimal form (use proper sig figs if possible; if not, say so):

5020. 51. 5.020×10^3 0.0056 52. 0.56×10^{-2}
- 73690000 53. 736.9×10^5 0.0000459 54. 0.000459×10^{-1}
- 0.0000008725 55. 8.725×10^{-7} 5600 56. 0.00560×10^6

Convert into scientific notation (use proper sig figs):

- 4.56×10^{-3} 57. 0.00456 1.7×10^{-2} 58. 170
- 5.0026×10^5 59. 500260 6.64×10^7 60. 0.000000664
- 7.369×10^7 61. $736.9 \times 10^5 \times 10^2$ 4.59×10^{-5} 62. 0.000459×10^{-1}
- 1.14×10^2 63. $0.0114 \times 10^4 \times 10^{-2}$ 3.00×10^1 64. 30.0×10^{-2}

Calculate the following. Use correct sig figs. Answer #71 and #72 in scientific notation.

249 mm 65. Add 245 mm and 3.87 mm 582.8 66. $246.24 + 238.278 + 98.3$

$$\begin{array}{r} 245 \\ + 3.87 \\ \hline 248.87 \end{array}$$

$$\begin{array}{r} 246.24 \\ + 238.278 \\ + 98.3 \\ \hline 582.818 \end{array}$$

(-1) -2.7×10^3 67. $1913.0 - 4.6 \times 10^3$

$$\begin{array}{r} 1913.0 \\ - 4.6 \times 10^3 \\ \hline -2687.0 \end{array}$$

1.47×10^3 68. $2.130 \times 10^3 - 6.6 \times 10^2$

$$\begin{array}{r} 2.130 \\ - 0.66 \\ \hline 1.470 \end{array}$$

$$0.66 \times 10^3 \times 10^{-1}$$

420 69. 35.4×12

$$35.4 \times 12 = 424.8$$

400 70. $0.83 \div 0.002$

$$0.83 \div 0.002 = 415$$

4.4×10^8 71. $(7.6 \times 10^4)(5.823 \times 10^3)$

$$\begin{array}{r} 7.6 \\ \times 5.823 \\ \hline 44.2548 \end{array} \times 10^4 \times 10^3 = 4.42548 \times 10^8$$

2.5×10^{-31} 72. $1.05 \times 10^{-26} \div 4.2 \times 10^{56}$

$$1.05 \times 10^{-26} \div 4.2 \times 10^{56} = 0.25 \times 10^{-82} = 2.5 \times 10^{-83}$$

$-26 - 56 = -82$

66 foolaps 73. If there are 17.3 foolaps in a prungle and you have 3.8 prungles, how many foolaps do you have? (use correct number of sig figs).

$$3.8 \times 17.3 = 65.74 \rightarrow 17.3 \text{ foolaps}$$

2,764,800 seconds

2592000s 74. How many seconds are there in 32 days?

2.592×10^6 $32 \text{ days} \times \frac{24 \text{ h}}{1 \text{ d}} \times \frac{60 \text{ m}}{1 \text{ h}} \times \frac{60 \text{ s}}{1 \text{ m}} = 2592000 \text{ s}$

Bonus: Use proper sig figs.

(a) $1.003 \text{ kg} - 12500 \text{ mg} = 1.003 \times 10^{-9}$

$$\begin{array}{r} 1.003 \text{ kg} \\ - 0.0000000125 \text{ kg} \\ \hline 1.003 \text{ kg} \end{array}$$

(b) $15000. \text{ mg} + 1500000. \text{ ng} + 3.0 \times 10^{-9} \text{ kg} = 11.515003 \times 10^3$

$$\begin{array}{r} 15000.0 \text{ mg} \\ + 1500000. \text{ ng} \\ + 0.000000003 \text{ kg} \\ \hline 1515000.003 \end{array}$$

(c) What is the volume of a box $1 \mu\text{m} \times 1 \text{ mm} \times 1 \text{ m}$? 1×10^{-6}

$$0.000001 \text{ m} \times 1 \text{ m} \times 1 \text{ m} = 1 \times 10^{-6} \text{ m}^3$$

$$1.515003 \times 10^9 \times 10^{-6} = 1.515003 \times 10^3$$

(d) How many nm^3 are in 1 m^3 ? 1×10^{27}

(e) $(7.25 + 23.1) \times 51.24 = 1560$ +2

$$\begin{array}{r} 7.25 \\ + 23.1 \\ \hline 30.35 \end{array} \times 51.24 = 1557.696 \rightarrow 1560$$

$$12.32 + 5.67 = 17.99$$

$$46.237 - 3.80 = 42.4370$$

(f) $\frac{(12.32 + 5.67) \times (46.237 - 3.80)}{(62.555 - 50.238)} = 9404$

$$\begin{array}{r} 62.555 \\ - 50.238 \\ \hline 12.317 \end{array} \times 763.5 = 9404.0295$$

$$17.99 \times 42.44 = 763.4956$$

Determine which electron configuration best matches each element.

- B 15. Argon
- A 16. Calcium
- D 17. Vanadium
- F 18. Iron
- H ~~G~~ I 19. Germanium -3
- H ~~G~~ I 20. Krypton

- A. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$
- B. $1s^2 2s^2 2p^6 3s^2 3p^6$
- C. $1s^2 2s^2 2p^6 3s^2 3p^6 3d^2$
- D. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^3$
- E. $1s^2 2s^2 2p^6 3s^2 3p^6 3d^6$
- F. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$
- G. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 5s^2$
- H. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^2$
- I. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6$
- J. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^8 4p^6$

BONUS: Write the electron configuration for cerium Ce (58 electrons; 2, 8, 18, 19, 9, 2)

$1s^2, 2s^2, 2p^6 | 3s^2, 3p^6, 4s^2, 3d^{10} | 4p^6, 5s^2, 4d^{10} | 5p^6, 6s^2, 4f^2$

$5f, 6d, 7p$

Quiz 2A-1 (through page 25)

True or False.

- T 1. Smoke from a fireplace is matter.
F 2. Magnetism is matter.
F 3. Air is a pure substance.
T 4. Sweetened tea is NOT a pure substance.

$\frac{1}{14} = 93\% A$
Excellent!

Determine whether each characteristic indicates a chemical (C) or a physical (P) property.

Ex: P Shiny

- P 5. Lighter than water
C 6. Dynamite exploding
C 7. Rusts in humid air
P 8. Vaporizes at 3000 degrees Celsius
P 9. Pleasant odor
C 10. Reacts when added to water
P 11. Ductile
P C 12. Green color
C 13. Produces a gas when mixed with an acid
P 14. Melts in a very hot flame

Quiz 2A-2 (through page 28)

8/13 = 38%

Determine whether each of the statements is referring to an (E) element, (C) compound, or (M) mixture. Ex: E They are listed in the periodic table.

- E 1. A pure substance that cannot be broken down into a simpler substance by ordinary chemical means
- M ~~E~~ 2. May be heterogeneous or homogeneous
- C 3. Carbon dioxide (CO₂) is an example
- C 4. Made up of atoms of two or more different elements that have bonded together chemically
- C ~~M~~ 5. They are represented by formulas *(like we did with the marshmallows)*
- E ~~X~~ 6. Hydrogen is an example
- E 7. They are represented by symbols
- M ~~X~~ 8. Physical combinations of pure substances

Using the formula shown below, determine the number of particles being referred to:



- | | | | |
|--------------|--|------------------------------|-------------------------|
| <u>3</u> | 9. How many magnesium (Mg) particles? | $3 \times 3 = 9$ | } We will go over this. |
| <u>3</u> | 10. How many phosphorus (P) particles? | $3 \times 2 = 6$ | |
| <u>4</u> | 11. How many oxygen (O) particles? | $3 \times (4 \times 2) = 24$ | |
| <u>3, 12</u> | 12. How many phosphate (PO ₄) particles? | $3 \times 2 = 6$ | |

Determine which choice BEST answers the question.

- C 13. Which of these is a triatomic element?

- a) H₂O
- b) O₂
- c) O₃
- d) NaOH
- e) CO₂

Formulas Quiz

For each formula below, list the number of each time of atom present:

Ex: $3\text{Mg}_3(\text{PO}_4)_2$ 9Mg, 6P, 24O

1. $\text{Na}_2\text{S}_2\text{O}_3$ 2Na 2S 3Oxygen ✓

2. $\text{Mg}(\text{NO}_3)_2$ 1Mg 2N 6Oxygen ✓

3. 3CaBr_2 3Ca 6Br ✓

4. $4\text{Fe}_2\text{O}_3$ 8Fe 12Oxygen ✓

5. $2\text{C}_{12}\text{H}_{12}\text{O}_{11}$ 24C 24H 22Oxygen ✓

6. $4\text{Li}_2\text{O}$ 8Li 2⁴Oxygen ✓

7. $5\text{Ca}(\text{OH})_2$ 5Ca 10Oxygen 10H ✓

8. $3(\text{NH}_4)_2\text{SO}_4$ 3N²⁴ 12H³ 3S¹² 24Oxygen ✓
_{6N}

9. $3\text{Mg}_3(\text{PO}_4)_2$ 9Mg 6P 24Oxygen ✓

10. $2\text{NH}_4\text{HCO}_3$ 2N 8H 2H 2C 6Oxygen ✓

Much better!
I am adding 15 points to your quiz grade.