

1. The central core of an atom consists of—
  - A nucleus and electrons
  - B electrons and neutrons
  - C protons and electrons
  - D neutrons and protons
  
2. The smallest particle of any element that still has the properties of that element is called—
  - F an atom
  - G a compound
  - H a solution
  - J a mixture
  
3. Using your knowledge of the atom, which sentence is correct?
  - A A proton and electron are similar in mass.
  - B A proton and neutron are similar in mass.
  - C A neutron and electron are similar in mass.
  - D A proton and nucleus are similar is mass.

4.

speck of dust
plant cell
molecule of water
atom

Four very small things are listed. Which is the smallest?

F speck of dust

G plant cell

H molecule of water

J atom

5. Which of the following atoms has a negative electrical charge?

A sulfur: 16 protons 18 electrons

B sodium: 11 protons 10 electrons

C silver: 47 protons 47 electrons

D iron: 26 protons 24 electrons

6.

## The Periodic Table of the Elements

Group 1												Group 13		Group 14		Group 15		Group 16		Group 17		Group 18
1 H 1.008	Group 2											5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18					
3 Li 6.94	4 Be 9.01											13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.06	17 Cl 35.45	18 Ar 39.95					
11 Na 22.99	12 Mg 24.31	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	Group 11	Group 12	31 Ga 69.72	32 Ge 72.59	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80					
19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.88	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.70	29 Cu 63.55	30 Zn 65.38	49 In 114.82	50 Sn 118.69	51 Sb 121.75	52 Te 127.60	53 I 126.90	54 Xe 131.30					
37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.94	43 Tc (97)	44 Ru 101.07	45 Rh 102.91	46 Pd 106.4	47 Ag 107.87	48 Cd 112.41	81 Tl 204.37	82 Pb 207.2	83 Bi 208.98	84 Po (209)	85 At (210)	86 Rn (222)					
55 Cs 132.91	56 Ba 137.33	57 La 138.91	72 Hf 178.49	73 Ta 180.95	74 W 183.85	75 Re 186.21	76 Os 190.2	77 Ir 192.22	78 Pt 195.09	79 Au 196.97	80 Hg 200.59											
87 Fr (223)	88 Ra 226.03	89 Ac (227)																				

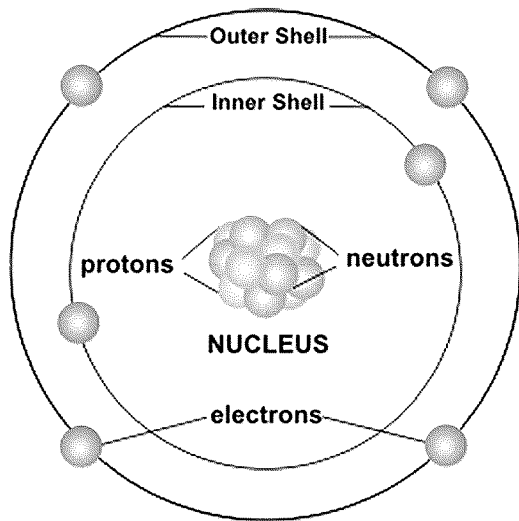
The nucleus of an oxygen, O, atom contains eight protons and eight neutrons. The approximate atomic mass of oxygen, O, is 16. What would be the number of neutrons in the elements sodium, Na, and sulfur, S?

- F 12 neutrons in sodium and 16 neutrons in sulfur
- G 16 neutrons in sodium and 12 neutrons in sulfur
- H 44 neutrons in sodium and 48 neutrons in sulfur
- J 48 neutrons in sodium and 44 neutrons in sulfur

7. The nucleus of an oxygen atom contains eight protons and eight neutrons. What is the approximate atomic mass of oxygen?

- A 8
- B 10
- C 16
- D 18

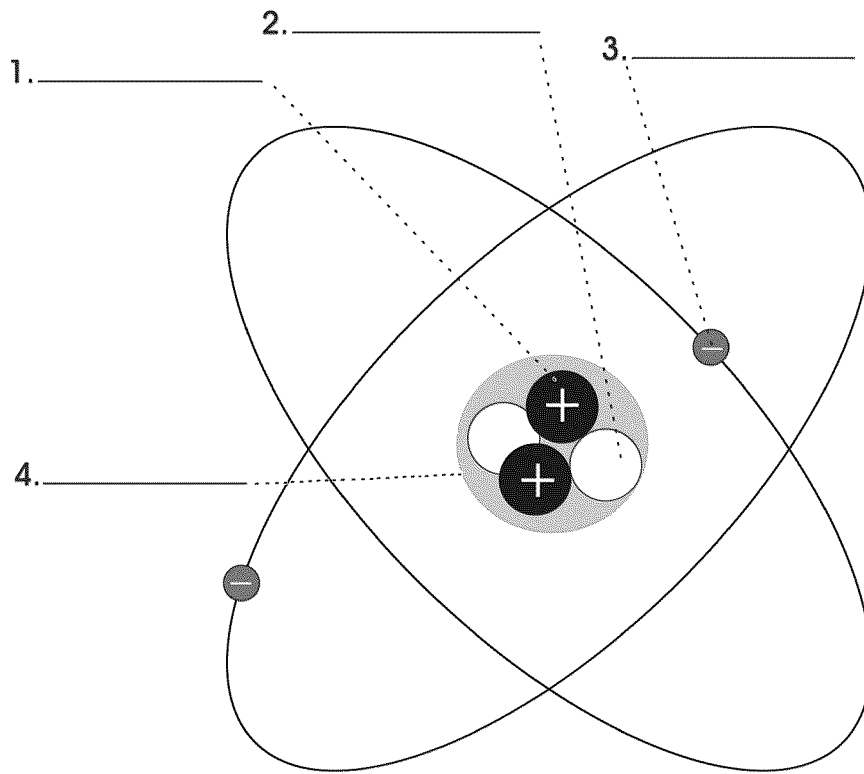
8. Look at the diagram of an atom.



What part of an atom does *not* have either a positive or negative charge?

- F nucleus
- G electrons
- H neutrons
- J protons

9. Look at the diagram of an atom.



What should be written on line 1?

- A proton
- B electron
- C neutron
- D nucleus

10. The mass number of calcium is equal to the \_\_\_\_\_.

F sum of 20 protons and 20 electrons

G difference between 20 protons and 20 electrons

H difference between 20 protons and 20 neutrons

J sum of 20 protons and 20 neutrons

11. The mass number of nitrogen, N, is—

A 7

B 14.007

C 28.014

D 5

12. All atoms are electrically—

F positive

G negative

H neutral

J charged

13. All atoms are electrically neutral. Atoms become electrically charged when they—
- A lose and gain electrons
  - B gain and lose protons
  - C same number of neutrons and protons
  - D different number of neutrons and protons
14. A certain atom has 26 protons, 26 electrons, and 30 neutrons. Its approximate mass number is—
- F 26
  - G 30
  - H 52
  - J 56
15. How many electrons may be contained in the energy level closest to the nucleus?
- A 0
  - B 2
  - C 8
  - D 18

16.

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3 <b>Li</b> 6.94	4 <b>Be</b> 9.01											13 <b>Al</b> 26.98	14 <b>Si</b> 28.09	15 <b>P</b> 30.97	16 <b>S</b> 32.06	17 <b>Cl</b> 35.45	18 <b>Ar</b> 39.95
11 <b>Na</b> 22.99	12 <b>Mg</b> 24.31	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	Group 11	Group 12	31 <b>Ga</b> 69.72	32 <b>Ge</b> 72.59	33 <b>As</b> 74.92	34 <b>Se</b> 78.96	35 <b>Br</b> 79.90	36 <b>Kr</b> 83.80
19 <b>K</b> 39.10	20 <b>Ca</b> 40.08	21 <b>Sc</b> 44.96	22 <b>Ti</b> 47.88	23 <b>V</b> 50.94	24 <b>Cr</b> 52.00	25 <b>Mn</b> 54.94	26 <b>Fe</b> 55.85	27 <b>Co</b> 58.93	28 <b>Ni</b> 58.70	29 <b>Cu</b> 63.55	30 <b>Zn</b> 65.38	49 <b>In</b> 114.82	50 <b>Sn</b> 118.69	51 <b>Sb</b> 121.75	52 <b>Te</b> 127.60	53 <b>I</b> 126.90	54 <b>Xe</b> 131.30
37 <b>Rb</b> 85.47	38 <b>Sr</b> 87.62	39 <b>Y</b> 88.91	40 <b>Zr</b> 91.22	41 <b>Nb</b> 92.91	42 <b>Mo</b> 95.94	43 <b>Tc</b> (97)	44 <b>Ru</b> 101.07	45 <b>Rh</b> 102.91	46 <b>Pd</b> 106.4	47 <b>Ag</b> 107.87	48 <b>Cd</b> 112.41	81 <b>Tl</b> 204.37	82 <b>Pb</b> 207.2	83 <b>Bi</b> 208.98	84 <b>Po</b> (209)	85 <b>At</b> (210)	86 <b>Rn</b> (222)
55 <b>Cs</b> 132.91	56 <b>Ba</b> 137.33	57 <b>La</b> 138.91	72 <b>Hf</b> 178.49	73 <b>Ta</b> 180.95	74 <b>W</b> 183.85	75 <b>Re</b> 186.21	76 <b>Os</b> 190.2	77 <b>Ir</b> 192.22	78 <b>Pt</b> 195.09	79 <b>Au</b> 196.97	80 <b>Hg</b> 200.59						
87 <b>Fr</b> (223)	88 <b>Ra</b> 226.03	89 <b>Ac</b> (227)															

The number of electrons in a sodium atom is—

F 12

G 11

H 23

J 34



17.

## The Periodic Table of the Elements

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3 <b>Li</b> 6.94	4 <b>Be</b> 9.01											13 <b>Al</b> 26.98	14 <b>Si</b> 28.09	15 <b>P</b> 30.97	16 <b>S</b> 32.06	17 <b>Cl</b> 35.45	18 <b>Ar</b> 39.95					
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The number of neutrons in a potassium atom is equal to—

- A 39
- B 20
- C 19
- D 58

18. The first shell of an atom can contain \_\_\_\_\_ electrons according to Bohrs theory.

- F 2
- G 4
- H 6
- J 8

19. The negatively charged particle that spins outside the nucleus of the atom is called the—
- A electron
  - B proton
  - C neutron
  - D quark
20. The number of protons of an atom can be determined by—
- F looking at the atomic number
  - G subtracting the mass number minus the atomic number
  - H adding the mass number and the atomic number
  - J multiplying the atomic number times two
21. The element mercury has the atomic number 80. How many protons and electrons are in a neutral mercury atom?
- A 80 protons, 80 electrons
  - B 40 protons, 40 electrons
  - C 160 protons, 80 electrons
  - D 80 protons, 0 electrons

22. Which one of the following statements is correct?
- F Electrons are positively charged.
  - G The atom is negatively charged.
  - H The atom has no charge (is neutral).
  - J Protons are negatively charged.
23. \_\_\_\_\_ is the sum of protons and neutrons in an atom.
- A mass percent
  - B oxidation
  - C mass number
  - D atomic number
24. Based on your knowledge of Chemistry, which of the following conclusions can you make about the atomic number of an element?
- F represents the number of protons and neutrons in an element
  - G is always half of the atomic mass
  - H represents the number of protons and electrons in an element
  - J determines the reactivity of an atom

25. Using your knowledge about the atom, which represents a neutral atom?

- A 12 protons, 12 neutrons, 11 electrons
- B 11 protons, 13 neutrons, 12 electrons
- C 14 protons, 14 neutrons, 15 electrons
- D 15 protons, 16 neutrons, 15 electrons

26.

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87 <b>Fr</b> (223)	88 <b>Ra</b> 226.03	89 <b>Ac</b> (227)																											

What is the atomic number of fluorine, F?

- F 18.998
- G 19
- H 9
- J 1

27.

A																		E																			
1	H																	2	He																		
B												D																									
3	Li	4	Be											5	B	6	C	7	N	8	O	9	F	10	Ne												
11	Na	12	Mg											13	Al	14	Si	15	P	16	S	17	Cl	18	Ar												
C		19	K	20	Ca	21	Sc	22	Ti	23	V	24	Cr	25	Mn	26	Fe	27	Co	28	Ni	29	Cu	30	Zn	31	Ga	32	Ge	33	As	34	Se	35	Br	36	Kr
37	Rb	38	Sr	39	Y	40	Zr	41	Nb	42	Mo	43	Tc	44	Ru	45	Rh	46	Pd	47	Ag	48	Cd	49	In	50	Sn	51	Sb	52	Te	53	I	54	Xe		
55	Cs	56	Ba		72	Hf	73	Ta	74	W	75	Re	76	Os	77	Ir	78	Pt	79	Au	80	Hg	81	Tl	82	Pb	83	Bi	84	Po	85	At	86	Rn			
87	Fr	88	Ra																	F																	
				57	La	58	Ce	59	Pr	60	Nd	61	Pm	62	Sm	63	Eu	64	Gd	65	Tb	66	Dy	67	Ho	68	Er	69	Tm	70	Yb	71	Lu				
				89	Ac	90	Th	91	Pa	92	U	93	Np	94	Pu	95	Am	96	Cm	97	Bk	98	Cf	99	Es	100	Fm	101	Md	102	No	103	Lr				

In the periodic table, the number above the symbol for each element represents—

- A the number of neutrons in an atom of the element
- B the number of protons in an atom of the element
- C the combined number of protons and neutrons in an atom of the element
- D the combined number of protons and electrons in an atom of the element

28. The number of outer shell electrons that an atom has is referred to as its—

F oxidation number

G atomic number

H valence

J mass number

29. The \_\_\_\_\_ is the number of protons in an atom.

A nucleus

B electrons

C metals

D atomic number

30. Which of the following elements would have a valence of 8?

F Br

G Ne

H H

J He

31. The chemical properties of an element are determined by its—

- A atomic mass
- B proton number
- C electron arrangement
- D atomic size

32. The electron arrangement of an element determines—

- F its reactivity only to noble gases and metals
- G its physical characteristics and atomic mass
- H its chemical characteristics and reactivity
- J its density in the periodic table of elements

33.

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The noble gases have a valence of 8, how many outer shell electrons do the elements in this family have?

- A 1
- B 4
- C 8
- D 18



34.

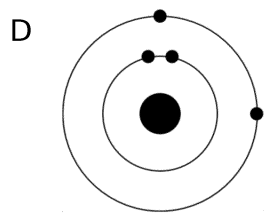
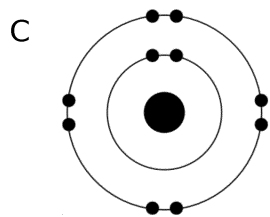
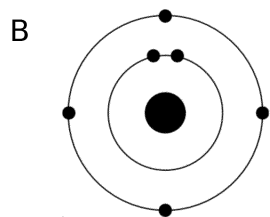
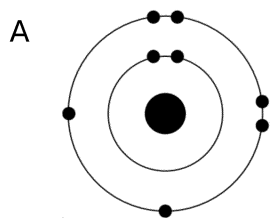
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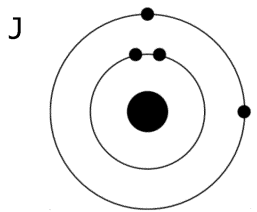
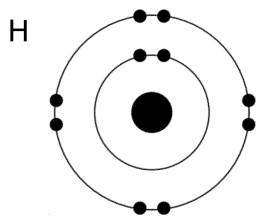
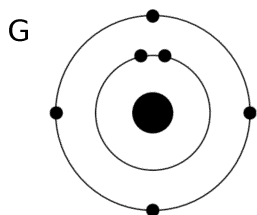
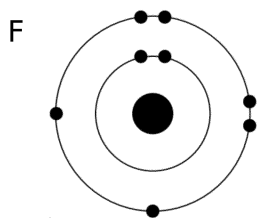
The electron configuration of an atom determines how the atom reacts with other atoms. Examine the atomic mass of each and determine which of the following substances is *most likely* to react with another substance.

- F sodium (Na)
- G beryllium (Be)
- H neon (Ne)
- J potassium (K)

35. An atom with which atomic diagram has chemical properties *most similar* to carbon?



36. An atom with which atomic diagram has chemical properties *most similar* to krypton?



37.

## The Periodic Table of the Elements

Group 1												Group 13		Group 14		Group 15		Group 16		Group 17		Group 18							
1 H 1.008	Group 2											5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18												
3 Li 6.94	4 Be 9.01											13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.06	17 Cl 35.45	18 Ar 39.95												
11 Na 22.99	12 Mg 24.31	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	Group 11	Group 12	19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.88	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.70	29 Cu 63.55	30 Zn 65.38	31 Ga 69.72	32 Ge 72.59	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80
37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.94	43 Tc (97)	44 Ru 101.07	45 Rh 102.91	46 Pd 106.4	47 Ag 107.87	48 Cd 112.41	49 In 114.82	50 Sn 118.69	51 Sb 121.75	52 Te 127.60	53 I 126.90	54 Xe 131.30												
55 Cs 132.91	56 Ba 137.33	57 La 138.91	72 Hf 178.49	73 Ta 180.95	74 W 183.85	75 Re 186.21	76 Os 190.2	77 Ir 192.22	78 Pt 195.09	79 Au 196.97	80 Hg 200.59	81 Tl 204.37	82 Pb 207.2	83 Bi 208.98	84 Po (209)	85 At (210)	86 Rn (222)												
87 Fr (223)	88 Ra 226.03	89 Ac (227)																											

Bromine (Br), atomic number 35, will *least* likely react with which of the following elements?

- A Magnesium (Mg)
- B Lithium (Li)
- C Helium (He)
- D Zinc (Zn)

38. Which would be the best statement that describes an electron cloud?

- F Neutral and negative particles make up the electron cloud.
- G Positive and negative particles make up the electron cloud.
- H Negative particles make up the electron cloud.
- J Positive particles make up the electron cloud.

39. Which *best* represents a stable sodium atom?
- A 11 protons, 12 neutrons, 11 electrons
  - B 12 protons, 12 neutrons, 12 electrons
  - C 11 protons, 11 neutrons, 11 electrons
  - D 12 protons, 13 neutrons, 11 electrons
40. Which of the following does *not* display that a chemical reaction has occurred?
- F A formation of a yellow precipitate after mixing two clear liquids
  - G A test tube becoming increasingly hot after mixing two liquids
  - H A test tube starts bubbling after mixing two liquids
  - J A liquid starts to freeze after being placed in the freezer.
41. Which is *not* an example of chemical change?
- A digesting food due to acid bile in stomach
  - B metal turning into rust due to oxidation
  - C ice melting due to the application of heat
  - D burning paper due to the application of heat

42. What is the difference between periods and groups within the periodic table?

F Periods are vertical columns and groups are horizontal rows.

G Periods are horizontal rows and groups are vertical columns.

H Periods contain elements with similar properties.

J Groups contain elements with different properties.

43. On the periodic table, the 'periods' are—

A vertical columns used to determine reactivity

B families of noble gases that are found on the last column

C horizontal rows used to determine electron placement

D groups of metals that have extreme radioactive properties

44. Vertical columns on the periodic table are called—

F groups

G families

H periods

J both a and b

45. On the periodic table, families are—
- A groups of elements sharing properties
  - B groups of elements that are not neutral
  - C groups of elements listed horizontally
  - D groups of elements listed diagonally
46. Elements with similar chemical properties are called—
- F metalloids
  - G atomic elements
  - H groups
  - J alters
47. Periods are \_\_\_\_\_ on the periodic table.
- A the vertical columns
  - B the horizontal rows
  - C on the stair-step line
  - D center row only

48. The members of the noble gas family are—

F helium, neon, argon because these gases are unreactive

G fluorine, chlorine, bromine because these gases are radioactive

H aluminum, lithium, iron because these gases are toxic

J boron, silicon, arsenic because these gases have no conductivity

49. The elements on the periodic table are arranged according to increasing—

A atomic mass

B stability

C activity

D atomic number



50. In 1869, a scientist grouped and organized the elements by their atomic weights. This grouping is now referred to as the Periodic Table.

1 H																	2 He																														
3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne																														
11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar																														
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr																														
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe																														
55 Cs	56 Ba		72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn																														
87 Fr	88 Ra		104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Uub	113 Uut	114 Uuq	115 Uup	116 Uuh	117 Uus	118 Uuo																														
<table border="1"> <tbody> <tr> <td>57 La</td> <td>58 Ce</td> <td>59 Pr</td> <td>60 Nd</td> <td>61 Pm</td> <td>62 Sm</td> <td>63 Eu</td> <td>64 Gd</td> <td>65 Tb</td> <td>66 Dy</td> <td>67 Ho</td> <td>68 Er</td> <td>69 Tm</td> <td>70 Yb</td> <td>71 Lu</td> </tr> <tr> <td>89 Ac</td> <td>90 Th</td> <td>91 Pa</td> <td>92 U</td> <td>93 Np</td> <td>94 Pu</td> <td>95 Am</td> <td>96 Cm</td> <td>97 Bk</td> <td>98 Cf</td> <td>99 Es</td> <td>100 Fm</td> <td>101 Md</td> <td>102 No</td> <td>103 Lr</td> </tr> </tbody> </table>																		57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu	89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr
57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu																																	
89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr																																	

Which of the following scientists is credited with being the “Father of the Periodic Table”?

- F Dmitri Mendeleev
- G Roger Bacon
- H Robert Boyle
- J John Dalton

51.

## The Periodic Table of the Elements

Group 1												Group 13		Group 14		Group 15		Group 16		Group 17		Group 18							
1 <b>H</b> 1.008												5 <b>B</b> 10.81	6 <b>C</b> 12.01	7 <b>N</b> 14.01	8 <b>O</b> 16.00	9 <b>F</b> 19.00	10 <b>Ne</b> 20.18												
3 <b>Li</b> 6.94	4 <b>Be</b> 9.01											13 <b>Al</b> 26.98	14 <b>Si</b> 28.09	15 <b>P</b> 30.97	16 <b>S</b> 32.06	17 <b>Cl</b> 35.45	18 <b>Ar</b> 39.95												
11 <b>Na</b> 22.99	12 <b>Mg</b> 24.31											19 <b>K</b> 39.10	20 <b>Ca</b> 40.08	21 <b>Sc</b> 44.96	22 <b>Ti</b> 47.88	23 <b>V</b> 50.94	24 <b>Cr</b> 52.00	25 <b>Mn</b> 54.94	26 <b>Fe</b> 55.85	27 <b>Co</b> 58.93	28 <b>Ni</b> 58.70	29 <b>Cu</b> 63.55	30 <b>Zn</b> 65.38	31 <b>Ga</b> 69.72	32 <b>Ge</b> 72.59	33 <b>As</b> 74.92	34 <b>Se</b> 78.96	35 <b>Br</b> 79.90	36 <b>Kr</b> 83.80
37 <b>Rb</b> 85.47	38 <b>Sr</b> 87.62	39 <b>Y</b> 88.91	40 <b>Zr</b> 91.22	41 <b>Nb</b> 92.91	42 <b>Mo</b> 95.94	43 <b>Tc</b> (97)	44 <b>Ru</b> 101.07	45 <b>Rh</b> 102.91	46 <b>Pd</b> 106.4	47 <b>Ag</b> 107.87	48 <b>Cd</b> 112.41	49 <b>In</b> 114.82	50 <b>Sn</b> 118.69	51 <b>Sb</b> 121.75	52 <b>Te</b> 127.60	53 <b>I</b> 126.90	54 <b>Xe</b> 131.30												
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87 <b>Fr</b> (223)	88 <b>Ra</b> 226.03	89 <b>Ac</b> (227)																											

How many shells would an element of sodium have electrons in?

- A 1
- B 2
- C 3
- D 4

52.

## The Periodic Table of the Elements

Group 1												Group 13						Group 18	
1 <b>H</b> 1.008	Group 2											5 <b>B</b> 10.81	6 <b>C</b> 12.01	7 <b>N</b> 14.01	8 <b>O</b> 16.00	9 <b>F</b> 19.00	10 <b>Ne</b> 20.18		
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Group 3		Group 4		Group 5		Group 6		Group 7		Group 8		Group 9		Group 10		Group 11		Group 12	
11 <b>Na</b> 22.99	12 <b>Mg</b> 24.31	19 <b>K</b> 39.10	20 <b>Ca</b> 40.08	21 <b>Sc</b> 44.96	22 <b>Ti</b> 47.88	23 <b>V</b> 50.94	24 <b>Cr</b> 52.00	25 <b>Mn</b> 54.94	26 <b>Fe</b> 55.85	27 <b>Co</b> 58.93	28 <b>Ni</b> 58.70	29 <b>Cu</b> 63.55	30 <b>Zn</b> 65.38	31 <b>Ga</b> 69.72	32 <b>Ge</b> 72.59	33 <b>As</b> 74.92	34 <b>Se</b> 78.96	35 <b>Br</b> 79.90	36 <b>Kr</b> 83.80
37 <b>Rb</b> 85.47	38 <b>Sr</b> 87.62	39 <b>Y</b> 88.91	40 <b>Zr</b> 91.22	41 <b>Nb</b> 92.91	42 <b>Mo</b> 95.94	43 <b>Tc</b> (97)	44 <b>Ru</b> 101.07	45 <b>Rh</b> 102.91	46 <b>Pd</b> 106.4	47 <b>Ag</b> 107.87	48 <b>Cd</b> 112.41	49 <b>In</b> 114.82	50 <b>Sn</b> 118.69	51 <b>Sb</b> 121.75	52 <b>Te</b> 127.60	53 <b>I</b> 126.90	54 <b>Xe</b> 131.30		
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Fluorine would have a valence of—

- F 1
- G 3
- H 7
- J 9

53.

## The Periodic Table of the Elements

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87 <b>Fr</b> (223)	88 <b>Ra</b> 226.03	89 <b>Ac</b> (227)																	

Which of the following elements can be characterized as a nonmetal?

- A Au
- B K
- C O
- D Sn

54.

## The Periodic Table of the Elements

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Lithium reacts violently in water. From the elements listed below, which group would act in a similar manner?

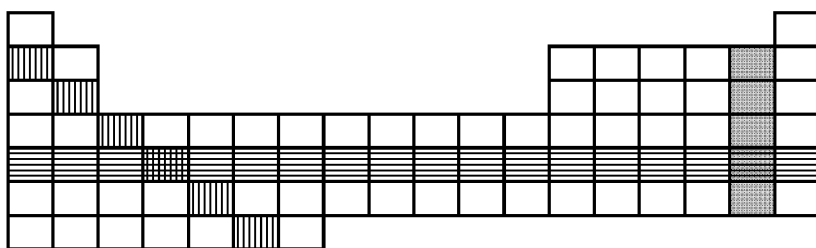
F Ar, Kr, Ne

G K, Na, Rb





H Mg, Ca, Sr

J F, Cl, Br

55. Use the model of the periodic table below to answer the following question(s).



In the model, which group of elements would have similar chemical properties?

- A 
- B 
- C 
- D 

56. Using the shaded areas in the model, how many elements share a period and a family?

- F 0
- G 1
- H 2
- J 3

57. All elements in the same group or family have the same number of—

- A neutrons
- B protons
- C valence electrons
- D energy levels

58. As you go across a period on the periodic table from left to right, which of the following is a true statement?

F elements go from metals to nonmetals

G elements go from tending to form negative ions to forming positive ions

H atoms of elements have less protons in the nuclei of their atoms

J atoms of elements have less mass

59. The chemical properties of an element are determined by its—

A atomic mass

B proton number

C electron arrangement

D atomic size

60. Oxygen has an atomic number of 8. Which of the following elements would you expect to be most similar to oxygen in terms of its chemical properties?

F Nitrogen (N)

G Fluorine (F)

H Sulfur (S)

J Chlorine (Cl)

61. The pictures below show the position of different elements on the periodic table. Which picture has an X in the locations of the three elements that would be most similar in the way they react?

A

X		
X		
X		

B

X	X	X

C

X		
	X	
		X

D

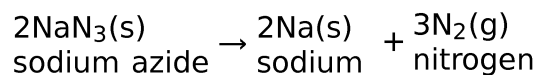
		X
	X	
X		

62. What is the difference between the atomic number and atomic mass?

- F Atomic number tells how many protons and electrons there are in an atom and atomic mass shows us the sum of protons and neutrons within the nucleus.
- G Atomic number tells how many protons and neutrons there are in an atom and atomic mass shows us the sum of electrons and neutrons within the nucleus.
- H Atomic number tells us the sum of protons and electrons there are in an atom and atomic mass shows us how many neutrons there are within the nucleus.
- J Atomic number tells us the sum of protons and neutrons there are within the nucleus of an atom and atomic mass shows us how many electrons there are in an atom.



63. Airbags are currently standard equipment in most automobiles. Airbags are activated when a severe impact causes a steel ball to compress a spring and electrically ignite a detonator cap. This series of events causes the following explosive chemical reaction.



In the equation in the box, the 2 in  $2\text{NaN}_3$  refers to the number of—

- A atoms of sodium  
B atoms of nitrogen  
C molecules of sodium azide  
D moles of nitrogen
64. A molecule of sulfuric acid made up of 2 atoms of hydrogen, 1 atom of sulfur, and 4 atoms of oxygen. Which of these is the molecular formula for sulfuric acid?
- F  $2\text{HS}_4\text{O}$   
G  $\text{H}-\text{H}-\text{S}-\text{O}-\text{O}-\text{O}-\text{O}$   
H  $\text{H}_2\text{S1}(\text{O}_2)_2$   
J  $\text{H}_2\text{SO}_4$
65. In which of the following situations is a chemical reaction occurring?
- A salt dissolves in water creating heat  
B a nail rusts because of oxidation  
C ice melts because heat is applied  
D a glass breaks by force of gravity

66. In which of the following situations is a chemical reaction occurring?

- F mixing corn starch and water
- G mixing vinegar and baking soda
- H mixing water and baking soda
- J mixing vinegar and corn syrup

67. Which is *not* an example of a chemical change?

- A boiling water
- B rusting iron
- C burning wood
- D baking bread

68. Which is *not* an example of a chemical change?

- F mixing sugar and sulfuric acid
- G mixing chalk and water
- H mixing ammonia and bleach
- J mixing vinegar and chalk

69. Robert is mixing baking soda and pieces of chalk. The mixture did not cause a chemical reaction. The addition of which substance will *most likely* cause a chemical change?
- A The addition of food coloring in which both substances remain the same because of the chemical change.
  - B The addition of vinegar in which both substances dissolve completely because of the chemical change.
  - C The addition of milk in which both substances remain the same because of the chemical change.
  - D The addition of water in which both substances dissolve completely because of the chemical change.
70. Which of the following describes a chemical change taking place?
- F Cutting paper with a scissors
  - G Dissolving sugar in a glass of water
  - H Allowing milk to sit out until it turns sour
  - J Making ice cubes with a tray of water in a freezer
71. Jonathan cooked an egg for breakfast. First he broke the shell and put the egg in a bowl where he beat it with a fork. He cooked the egg, placed it on his plate, and cut it up into smaller pieces to eat. Which of the following involves a chemical change in the egg?
- A Beating the egg caused the egg to liquefy.
  - B Heating the egg caused the egg to solidify.
  - C Breaking the egg caused the egg to spread.
  - D Cutting the egg caused the egg to shrink.

72. Stephanie wanted to know whether the size of chalk pieces would affect how quickly a given mass of chalk would react with vinegar. She took three identical sticks of white chalk. She broke one stick into large pieces, one into small pieces, and crushed one into powder. She then added 20 milliliters of vinegar to each sample and measured the time until the reaction was completed.

What would *most likely* be the conclusion of this investigation?

- F A faster rate of chemical reaction because the surface area of the chalk increased.
- G A faster rate of chemical reaction because the surface area of the chalk decreased.
- H A slower rate of chemical reaction because the surface area of the chalk increased.
- J A slower rate of chemical reaction because the surface area of the chalk decreased.

73. The chemical reaction that occurs in burning wood—

- A gives off heat, so it is endothermic
- B gives off heat, so it is exothermic
- C requires heat to get started, so it is endothermic
- D requires heat and gives off heat, so it is neither

74. The energy of motion of a vehicle comes from the combustion, or rapid burning, of a gasoline-and-air mixture inside the vehicle's cylinders. This burning gas expands, causing a piston in the cylinder to expand. This, in turn - through a series of mechanical actions - causes the wheels to turn. Combustion can be best described as—

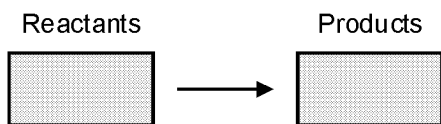
- F Exothermic reaction, because the piston expands and gives off heat
- G Endothermic reaction, because the piston expands and gas burns inside the cylinder
- H Acid-Base reaction, because the gasoline igniting will turn from an acid to a base.
- J No reaction occurs inside the vehicle's cylinders.

75. A student makes a repair with epoxy glue. He squeezes equal amounts of the material from two different tubes, combines them, and applies the mixture to some broken pieces. While holding the parts together for a moment, he notices that the repaired area becomes slightly warm to the touch. The mixture becomes solid as it cures, forming a strong bond that holds the broken pieces together.

What evidence for a chemical reaction is demonstrated by the repair of the broken pieces?

- A The cured mixture has formed a bonding solid with properties different from those of the starting materials.
- B Materials from the two different tubes have been squeezed out of their tubes and combined.
- C The materials from the two different tubes are made out of chemicals.
- D More than one material is required to form a mixture that is applied to the broken pieces.

76.



The diagram shows a chemical equation with the substances on either side of the equation hidden from view. From the law of conservation of mass, we know that—

- F the products must weigh more than the reactants
- G energy is neither absorbed nor released by the reaction
- H the substances on either side of the equation must be the same
- J the number of atoms on either side of the equation must be the same

**STAAR One Item Bank - Test and Answer Key**

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Untitled    Beatriz Medrano    4/16/2013

1.  
Answer: D  
TEKS/SE: 8.5A  
DOK: 1

2.  
Answer: F  
TEKS/SE: 8.5A  
DOK: 1

3.  
Answer: B  
TEKS/SE: 8.5A  
DOK: 1

4.  
Answer: J  
TEKS/SE: 8.5A  
DOK: 2

5.  
Answer: A  
TEKS/SE: 8.5A  
DOK: 1

6.  
Answer: F  
TEKS/SE: 8.5A  
DOK: 1

7.  
Answer: C  
TEKS/SE: 8.5A  
DOK: 1

8.  
Answer: H  
TEKS/SE: 8.5A  
DOK: 1

9.  
Answer: A  
TEKS/SE: 8.5A  
DOK: 1

10.  
Answer: J  
TEKS/SE: 8.5A  
DOK: 2

11.  
Answer: B  
TEKS/SE: 8.5A  
DOK: 1

12.  
Answer: H  
TEKS/SE: 8.5A  
DOK: 1

13.  
Answer: A  
TEKS/SE: 8.5A  
DOK: 1

14.  
Answer: J  
TEKS/SE: 8.5A  
DOK: 1

15.  
Answer: B  
TEKS/SE: 8.5A  
DOK: 1

16.  
Answer: G  
TEKS/SE: 8.5A  
DOK: 2

17.  
Answer: B  
TEKS/SE: 8.5A  
DOK: 2

18.  
Answer: F  
TEKS/SE: 8.5A  
DOK: 1

19.  
Answer: A  
TEKS/SE: 8.5A  
DOK: 1

20.  
Answer: F  
TEKS/SE: 8.5A  
DOK: 1

21.  
Answer: A  
TEKS/SE: 8.5A  
DOK: 1

22.  
 Answer: H  
 TEKS/SE: 8.5A  
 DOK: 1

23.  
 Answer: C  
 TEKS/SE: 8.5A  
 DOK: 1

24.  
 Answer: H  
 TEKS/SE: 8.5A  
 DOK: 1

25.  
 Answer: D  
 TEKS/SE: 8.5A  
 DOK: 1

26.  
 Answer: H  
 TEKS/SE: 8.5B  
 DOK: 1

27.  
 Answer: B  
 TEKS/SE: 8.5B  
 DOK: 1

28.  
 Answer: H  
 TEKS/SE: 8.5B  
 DOK: 1

29.  
 Answer: D  
 TEKS/SE: 8.5B  
 DOK: 1

30.  
 Answer: G  
 TEKS/SE: 8.5B  
 DOK: 1

31.  
 Answer: C  
 TEKS/SE: 8.5B  
 DOK: 1

32.  
 Answer: H  
 TEKS/SE: 8.5B  
 DOK: 1

33.  
 Answer: C  
 TEKS/SE: 8.5B  
 DOK: 1

34.  
 Answer: F  
 TEKS/SE: 8.5B  
 DOK: 2

35.  
 Answer: B  
 TEKS/SE: 8.5B  
 DOK: 2

36.  
 Answer: H  
 TEKS/SE: 8.5B  
 DOK: 2

37.  
 Answer: C  
 TEKS/SE: 8.5B  
 DOK: 2

38.  
 Answer: H  
 TEKS/SE: 8.5C  
 DOK: 1

39.  
 Answer: A  
 TEKS/SE: 8.5C  
 DOK: 1

40.  
 Answer: J  
 TEKS/SE: 8.5C  
 DOK: 1

41.  
 Answer: C  
 TEKS/SE: 8.5C  
 DOK: 1

42.  
 Answer: G  
 TEKS/SE: 8.5C  
 DOK: 1

43.  
 Answer: C  
 TEKS/SE: 8.5C  
 DOK: 1

44.  
 Answer: F  
 TEKS/SE: 8.5C  
 DOK: 1

45.  
 Answer: A  
 TEKS/SE: 8.5C  
 DOK: 1



46.  
 Answer: H  
 TEKS/SE: 8.5C  
 DOK: 1

47.  
 Answer: B  
 TEKS/SE: 8.5C  
 DOK: 1

48.  
 Answer: F  
 TEKS/SE: 8.5C  
 DOK: 1

49.  
 Answer: D  
 TEKS/SE: 8.5C  
 DOK: 1

50.  
 Answer: F  
 TEKS/SE: 8.5C  
 DOK: 1

51.  
 Answer: C  
 TEKS/SE: 8.5C  
 DOK: 2

52.  
 Answer: H  
 TEKS/SE: 8.5C  
 DOK: 2

53.  
 Answer: C  
 TEKS/SE: 8.5C  
 DOK: 1

54.  
 Answer: G  
 TEKS/SE: 8.5C  
 DOK: 2

55.  
 Answer: C  
 TEKS/SE: 8.5C  
 DOK: 2

56.  
 Answer: H  
 TEKS/SE: 8.5C  
 DOK: 2

57.  
 Answer: C  
 TEKS/SE: 8.5C  
 DOK: 1

58.  
 Answer: F  
 TEKS/SE: 8.5C  
 DOK: 1

59.  
 Answer: C  
 TEKS/SE: 8.5C  
 DOK: 1

60.  
 Answer: H  
 TEKS/SE: 8.5C  
 DOK: 1

61.  
 Answer: A  
 TEKS/SE: 8.5C  
 DOK: 1

62.  
 Answer: F  
 TEKS/SE: 8.5C  
 DOK: 2

63.  
 Answer: C  
 TEKS/SE: 8.5D  
 DOK: 1

64.  
 Answer: J  
 TEKS/SE: 8.5D  
 DOK: 1

65.  
 Answer: B  
 TEKS/SE: 8.5E  
 DOK: 1

66.  
 Answer: G  
 TEKS/SE: 8.5E  
 DOK: 2

67.  
 Answer: A  
 TEKS/SE: 8.5E  
 DOK: 1

68.  
 Answer: G  
 TEKS/SE: 8.5E  
 DOK: 2

69.  
 Answer: B  
 TEKS/SE: 8.5E  
 DOK: 2

70.  
 Answer: H  
 TEKS/SE: 8.5E  
 DOK: 1

71.  
 Answer: B  
 TEKS/SE: 8.5E  
 DOK: 1

72.  
 Answer: G  
 TEKS/SE: 8.5E  
 DOK: 3

73.  
 Answer: B  
 TEKS/SE: 8.5E  
 DOK: 1

74.  
 Answer: F  
 TEKS/SE: 8.5E  
 DOK: 2

75.  
 Answer: A  
 TEKS/SE: 8.5E  
 DOK: 3

76.  
 Answer: J  
 TEKS/SE: 8.5F  
 DOK: 2