## **WELCOME STEM SOPHOMORES!**

- Honors STEM Chemistry
- Science assignment is due the fourth day of school contact: <a href="mailto:jenny.lee@cobbk12.org">jenny.lee@cobbk12.org</a>

Welcome to STEM Chemistry. Questions? Contact: <a href="mailto:jenny.lee@cobbk12.org">jenny.lee@cobbk12.org</a>

STEM Chemistry is for the student who desires a more in-depth study of science that will incorporate various aspects of science and math with an emphasis on both mastery and critical thinking/application skills. This is a fast-paced course that requires <u>much outside</u> classroom preparation. A summer assignment is essential to a good foundation as we incorporate more reading across the curriculum and giving all students an opportunity to learn more about what chemistry prior to starting the course! This class requires a **strong work ethic** and the ability to work independently. Let's start strong by getting ahead-start!

Make sure that you complete **all** parts of the summer assignment! The assignment will be due on the fourth day of the 2023-2024 school year. Do not wait until the end of the summer to start working!

You MUST complete ALL sections and be ready for Section 1 the 4<sup>th</sup> day of school:

Section 1: Memorize the required elements (1-40) AND their location on the Periodic Table – expect an assessment the fourth day of school (August 5<sup>th</sup> ) over the following:

- a. Element symbol with correct capitalization (first letter capitol, second lowercase)
- b. Correct spelling of the element (all lower case not proper nouns)
- c. You do not need to know the numbers, but you do need to know the location on the periodic table as your test will be filling a blank periodic table.
- d. The best way to study is to print a blank table from the end of this packet or from the internet and practice filling it in. There is a song that is useful as well that sings them in the correct order.

Section 2: YOU WILL HAVE TO LEARN ELEMENTS 41-92 (not including 58-71) for another assessment, which will be 2 weeks into school. It is a good idea to go ahead and study these.

SEE DOCUMENTS ON NEXT PAGES:

## **PERIODIC TABLE OF THE ELEMENTS**

GROUP																	
IA																	VIII
1.00794																	2 4.00260 4.216
13.81 0.0899 †																	0.95 st 22 str. 0.1785† He
1s1 Hydrogen	IIA											ШВ	IVB	VB	VIB	VIIB	1s² Helium
3 6.941	4 9.01218											5 10.811	6 12.011 ±4.2	7 14.0067 ±3,5,4,2	8 15.9994	9 18.99840	10 20.1797
1615 453.7	1560 Be											4275 2385	3825*	77.344 63.15	90.188 54.8	85.0 53.55	27.10 24.55
0.53	1.85 L/C 1s <sup>2</sup> 2s <sup>2</sup> Beryllium											2.34 D 1s <sup>2</sup> 2s <sup>2</sup> p <sup>1</sup>	2.26 1s <sup>2</sup> 2s <sup>2</sup> p <sup>2</sup>	1.251 <sup>†</sup> 1s <sup>2</sup> 2s <sup>2</sup> p <sup>3</sup>	1.429 <sup>†</sup>	1.696 <sup>†</sup> 1s <sup>2</sup> 2s <sup>2</sup> p <sup>5</sup>	0.900 T 18°2s°p°
1 1 22.98977	12 24.305											13 26.98154	Carbon 1 1 28.0855	Nitrogen 1530.97376	16 32.066	17 35.4527	Neon 18 39.948
1156	1380											2740 933.5	2630 <b>4,2</b> 1683 <b>C</b>	13,5,4 553 317.3	717.82 392.2	±1,3,5,7 239.18 172.17	67.45 63.95
0.97 Ne)3s1	1.74 W 9 [Ne]3s <sup>2</sup>		****									2.70 A	2.33 DI	1.82 [Ne]3s <sup>2</sup> p <sup>3</sup>	2.07 Ne]3s²p⁴	3.214† 😈	1.784†
Sodium	Magnesium	IIIA	IVA	VA	VIA	VIIA		-VIIIA-		IB	IIB	Aluminum	Silicon	Phosphorus	Sulfur	[Ne]3s²p <sup>6</sup> Chlorine	[Ne]3s²p <sup>e</sup> Argon
19 39.0983	20 40.078	21 44.9559	22 47.88	23 50.9415 5,4,3,2	24 51.996 3,6,2	25 54.9380 2,3,4,6,7	26 55.847	27 58.9332 2,3	28 58.6934	29 63.546 2,1	30 65,39	31 69.723	32 72.61	33 74.9216 ±3,5	34 78.96	35 79.904 ±1,5,7	36 83.80
0.86	1112 <b>Ca</b>	1814 2.99 <b>5C</b>	1935 4.54	2163 6.11	2130 <b>C</b>	1518 <b>VIN</b>	1808 7.874	1768 <b>CO</b>	1726 8.90	1356.6 <b>CU</b>	692.73 Zn	902.92 <b>Ga</b>	1211.5 <b>Ge</b>	1090 AS	494 4.79 <b>Se</b>	265.95 3.12	116 3.75†
[Ar]4s <sup>1</sup> Potassium	[Ar]4ş² Calcium	[Ar]3d14s2 Scandium	[Ar]3d²4s² Titanium	[Ar]3d <sup>3</sup> 4s <sup>2</sup> Vanadium	[Ar]3d <sup>5</sup> 4s <sup>1</sup> Chromium	[Ar]3d <sup>5</sup> 4s <sup>2</sup> Manganese	[Ar]3d <sup>6</sup> 4s <sup>2</sup> Iron	(Ar)3d <sup>7</sup> 4s <sup>2</sup> Cobalt	[Ar]3d <sup>8</sup> 4s <sup>2</sup> Nickel	[Ar]3d <sup>10</sup> 4s <sup>1</sup> Copper	[Ar]3d <sup>10</sup> 4s <sup>2</sup> Zinc	[Ar]3d104s2p1 Gallium	[Ar]3d <sup>10</sup> 4s <sup>2</sup> p <sup>2</sup> Germanium	[Ar]3d <sup>10</sup> 4s <sup>2</sup> p <sup>3</sup> Arsonic	[Ar]3d <sup>10</sup> 4s <sup>2</sup> p <sup>4</sup> Selenium	(Ar)3d <sup>10</sup> 4s <sup>2</sup> p <sup>5</sup> Bromine	[Ar]3d <sup>16</sup> 4s <sup>2</sup> p <sup>6</sup> Krypton
37 85.4678	2	39 88.9059	40 91.224	41 92.9064	42 95.94	43 (98)	44 101.07	45102.9055	46 106.42	47 107.868	48 112.41	49 114.82	50 118,710	51 121.757 ±3.5	52 127.60	53 126.9045 #1,5,7	54 131.29
961 312.63 <b>Rb</b>	1655 1042 <b>Sr</b>	3611 1795	4582 2128 <b>7</b> Y	5015 2742	4912 2896 MA	4638 2477 11.5	<sup>4425</sup> <sub>2610</sub> <sub>12.37</sub> Ru	3970 Dh	3240 1825 DA	2436 1235.08	1040 594.26	2350 429.78	2876 505.12 <b>Cn</b>	1850 <b>Ch</b>	1261 722.72 <b>T</b>	457.5 396.7	165.1 161.39
[Kr]5s1	[Kr]5s <sup>2</sup>	4.47 [Kr]4d15s2	6.51 [Kr]4d <sup>2</sup> 5s <sup>2</sup>	8.57 Kr]4d <sup>4</sup> 5s <sup>1</sup>	10.22 Kr]4d <sup>5</sup> 5s <sup>1</sup>	[Kr]4d 55s2	[Kr]4d /5s1	12.41 [Kr]/Id <sup>®</sup> 5s <sup>1</sup>	12.0 Kr]4d 10	10.50 TS [Kr]4d <sup>13</sup> 5s <sup>1</sup>	8.65 Kr]4d105s2	7.31 Kr]4d <sup>10</sup> 5s <sup>2</sup> p <sup>1</sup>	7.31 (Kr]4d105s2p2	6.69 (Kr)4d <sup>10</sup> 5s <sup>2</sup> p <sup>3</sup>	[Kr]4d <sup>10</sup> 5s <sup>2</sup> p <sup>4</sup>	4.93 [Kr]4d105s8p0	5.90 † / C [Kr]4d <sup>10</sup> 5s <sup>2</sup> p <sup>6</sup>
55132.9054	56 137.33	7ttrium 57138.9055	Zirconium 72 178.49	Niobium 72 180.9479	Molybdenum 7/1 183.85	75 186.207	Ruthenium	77 192.22	78 195.08	70196 9665	200.59	Indium 204.383	Tin 207.2	Antimony	Tellurium	lodine (210)	Xenon
944 001.54	2070	3737 1191	4875 2504	5730	6,5,4,3,2	7,6,4,2	76 190.2	2,3,4,6 4700	4100	79196.9665 3,1	629.88	81 204.383 3,1	2023	83 208.9804 3,5	84 (209)	85 (210) 610' ±1,3,5,7	86 (222) 211.4
1.87	3.59 DQ	6.15 <b>LC</b>	13.31	16.65	3695 19.3	3455 Re	22.6 <b>US</b>	2720 22.6	21.45	1337.58 19.3	13.55	11.85	11.35	544.59 9.75 <b>B</b>	9.3 PO	575 <b>A</b> T	9.73 KN
(Xe)6s1 Cesium	[Xe]6s² Barlum	[Xe]5d¹6s² Lanthanum	[Xe]4f <sup>14</sup> 5d <sup>2</sup> 6s <sup>2</sup> Hafnium	[Xe]4f <sup>14</sup> 5d <sup>3</sup> 6s <sup>2</sup> Tantalum	[Xe]4f <sup>14</sup> 5d <sup>4</sup> 6s <sup>2</sup> Tungsten	[Xe]4f <sup>14</sup> 5d <sup>8</sup> 6s <sup>2</sup> Rhenium	[Xe]4f <sup>14</sup> 5d <sup>6</sup> 6s <sup>2</sup> Osmium	[Xe]4f145d76s2 iridium	[Xe]4f1*5d*6s1 Platinum	[Xe]4f145d146s1 Gold	[Xe]4fl45dl06s2 Mercury	[Xe]4f145d196s2p1 Thallium	[Xe]4f145d196s2p2 Lead	[Xe]4f <sup>14</sup> 5d <sup>10</sup> 6s <sup>2</sup> p <sup>3</sup> Bismuth	[Xe]4f <sup>14</sup> 5d <sup>10</sup> 8s <sup>2</sup> p <sup>4</sup> Polonium	Xoj4f145d196s2p1 Astatine	[Xe]4f1-5d196s2p9 Radon
87 (223)	88 226.0254	89 (227)	104 (261)	105 (262)	106 (263)	107 (262)	108 (265)	109 (266)	110 (272)				The A &	B subgroup	designations.	applicable to	elements in
300 Fr	973 Ra	1324 10.07 <b>AC</b>	= R	- 48	- Sg	E Uns	= Uma	- Une	= Omm				rows 4, 5	, 6 and 7, are		mended by the	International
[Rn]7s1 Francium	[Rn]7s² Radium	[Rn]6d <sup>1</sup> 7s <sup>2</sup> Actinium	[Rn]5f146d27s2 (Rutherfordium)	[Rn]5f1*6d37s2 (Hahnium)	[Rn]5f146d47s2	[Rn]5f146d57s2 (Unnilseptium)	[Rn]5l146d*7s* (Unniloctium)	[Rn]5f <sup>1/6</sup> d <sup>7</sup> 7s <sup>2</sup> (Unnilnonium)	[Rn]5f146d87s2" (Ununnilium)				The nam	es for element	s 104-106 hav		sed, but not
• Entimated No.						,		()	()	1			formally	accepted by the	ne IUPAC.		
				E0140 9077				CO 151 005					CO 40700				

\*\* 58 140.12 59140.9977 60 144.24 61 145) 62 150.86 63 151.96 64 157.25 65 158.9283 66 162.50 67 164.9303 68 157.28 69 168.9342 70 173.04 71 174.967 87 1757 CP 1757 C

## Elements Practice Page

This page is to help you learn the required elements. For each element 1-92 (excluding elements 58-71), you must be able to correctly spell the name of the element and you must be able to recall the element symbol with proper capitalization. This page is not to be turned in.

#	Name	Symbol	#	Name	Symbol
1			41		
2			42		
3			43		
4			44		
5			45		
6			46		
7			47		
8			48		
9			49		
10			50		
11			51		
12			52		
13			53		
14			54		
15			55		
16			56		
17			57		
18				SKIP ELEMENTS 58-71	
19			72		
20			73		
21			74		
22			75		
23			76		
24			77		
25			77		
26			78		
27			79		
28			80		
29			81		
30			82		
31			83		
32			84		
33			85		
34			86		
35			87		
36			88		
37			89		
38			90		
39			91		
40			92		