

Electron Configuration Battleship

Purpose: To teach students how to look at an element on the periodic table and instantly determine its electron configuration.

Materials: 1 Manila file folder per student, 2 laminated periodic tables per folder, dry-erase or overhead markers (1 per student).

Assembly: Tape the periodic tables to the top and the bottom of the inside of the manila folder, both of them right-side up.

Playing the Game:

- The game is played like traditional battleship in groups of two students. Each student has the manila folder open so that the opponent cannot see either of his/her periodic tables.
- Each player puts a line through the appropriate number of elements to indicate an aircraft carrier (5 elements), a battleship (4 elements), a submarine (3 elements), a destroyer (3 elements), and a PT boat (2 elements). Note: the number of ships can be increased which will create more "hits" and more fun!
- The first player calls a valence configuration for an element of his/her choice. For example, carbon would be $2p^2$. The other player states the name of the element called (in order to verify understanding of the "code" between the players), and then says "hit" or "miss."
- The player stating the configuration marks the top periodic table to note shots taken, and the player being "shot at" marks hits and misses on the bottom periodic table.
- Play continues until all ships are "sunk."

Extensions: The method of stating configurations can vary. For example, Ge could be stated $4p^2$ or $4s^24p^2$. Iron could be stated $3d^6$ or $4s^23d^6$, etc...

1	2	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10																						
1,008	2	21	22	23	24	25	26	27	28	29	30	26,982	4,003																														
3	4	←	←	←	←	3d	←	←	←	←	←	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22														
6,941	9,012	44.96	47.88	50.94	51.996	54.94	55.85	58.933	58.69	63.55	65.39	69.723	72.61	74.92	78.96	79.90	83.80	85.47	87.62	88.91	91.224	92.91	95.94	98.91	102.91	106.42	107.87	112.41	114.82	118.71	121.75	127.60	128.90	131.29									
11	12	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71									
22,999	24.31	88.91	89	88	87	86	85	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64	63	62	61	60	59	58									
19	20	132.91	137.33	138.91	178.49	180.95	183.85	186.21	190.23	192.22	195.08	196.97	200.6	204.4	207.2	209.0	(209)	(210)	(223)	226.03	227.03	(261)	(262)	(263)	(264)	(265)	(266)	(269)	(272)	(277)	284.4	286.03	287.05	(244)	(243)	(247)	(247)	(251)	(252)	(257)	(258)	(259)	(260)

1S
2S
3S
4S
5S
6S
7S

1 2 3 4 5 6 7 8 9 10 11 12 13 14

* Lanthanides	58	59	60	61	62	63	64	65	66	67	68	69	70	71
	140.12	140.91	144.2	(145)	150.36	151.97	157.25	158.99	162.50	164.93	167.26	168.93	173.04	174.97
† Actinides	90	91	92	93	94	95	96	97	98	99	100	101	102	103
	232.0	231.04	238.03	237.05	(244)	(243)	(247)	(247)	(251)	(252)	(257)	(258)	(259)	(260)

4f
5f

2p
3p
4p
5p
6p

1	2	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	
1.008	4	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
3	4	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
6.941	9.012	40.08	44.96	47.88	50.94	51.996	54.94	55.85	58.933	58.69	63.55	65.39	69.723	72.61	74.92	78.96	79.90	83.80	85.47	87.62	88.91	91.224
11	12	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58
22.99	24.31	40.08	44.96	47.88	50.94	51.996	54.94	55.85	58.933	58.69	63.55	65.39	69.723	72.61	74.92	78.96	79.90	83.80	85.47	87.62	88.91	91.224
132.91	137.33	138.91	178.49	180.95	183.85	186.21	190.23	192.22	195.08	196.97	200.6	204.4	207.2	209.0	(209)	(210)	(222)	(223)	226.03	227.03	227.03	(261)

1S
2S
3S
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	232.0	231.04	238.03	237.05	(244)	(243)	(247)	(247)	(251)	(252)	(257)	(258)	(259)	(260)

1 2 3 4 5 6 7 8 9 10 11 12 13 14

4f
5f

2p
3p
4p
5p
6p