

PERIODIC TABLE ACTIVITY

Objectives:

- To make a colorful, educational periodic table that shows reactivity of elements.
- To make connections with the arrangement of the elements on the periodic table to the arrangements with electron configuration.

Procedure:

- Color a box around each of the alkali metals, Group 1, in red, because alkali metals are WILDLY reactive. Shade lithium the lightest at the top through darkest at the bottom to indicate the increasing reactivity of the group members.

Complete the chart on the alkali metals.

SYMBOL	ELEMENT NAME	ELECTRON CONFIGURATION	ELECTRON DOT
Li	Lithium	2-1	Li
Na	Sodium	2-8-1	Na
K	Potassium	2-8-8-1	K
Rb	Rubidium	2-8-18-8-1	Rb
Cs	Cesium	2-8-18-18-8-1	Cs
Fr	Francium	2-8-18-32-18-8-1	Fr

Reactivity is a measure of how intense an element gains or loses electrons. The alkali metals lose 1 electron. Suggest a reason why francium would be more reactive than lithium in losing electrons.

The 1 electron is further from the nucleus, thus more likely wanting to lose electron.

- Color a box around each of the alkaline earth metals, Group 2, in orange because they are less reactive than the alkali metals. Color beryllium the lightest at the top through darkest at the bottom to indicate increasing reactivity of the group members.

Complete the chart on the alkaline earth metals.

SYMBOL	ELEMENT NAME	ELECTRON CONFIGURATION	ELECTRON DOT
Be	Beryllium	2-2	$\cdot\ddot{\text{Be}}\cdot$
Mg	Magnesium	2-8-2	$\cdot\ddot{\text{Mg}}\cdot$
Ca	Calcium	2-8-8-2	$\cdot\ddot{\text{Ca}}\cdot$
Sr	Strontium	2-8-18-8-2	$\cdot\ddot{\text{Sr}}\cdot$
Ba	Barium	2-8-18-18-8-2	$\cdot\ddot{\text{Ba}}\cdot$
Ra	Radium	2-8-18-32-18-8-2	$\cdot\ddot{\text{Ra}}\cdot$

- Color a box around each of the transition elements in Group 3-11 pale yellow because they are only slightly reactive compared to the other groups of metals.
- Color a box around the metalloids (semi-metals) with atomic numbers 5, 14, 32, 33, 51 and 52 in green. Metalloids have both properties of metals, like transitions metals (yellow) and non-metals like the halogens (blue).
- Color a box around the halogens, Group 17, in blue because they are very reactive and at the other end of the spectrum of chemical behavior of the alkali metals. Color fluorine the darkest because it has the greatest reactivity and lighten to astatine because it is least chemically reactive in the group.

Complete the chart on the halogens.

SYMBOL	ELEMENT NAME	ELECTRON CONFIGURATION	ELECTRON DOT
F	Fluorine	2-7	$\cdot\ddot{\text{F}}\cdot$
Cl	Chlorine	2-8-7	$\cdot\ddot{\text{Cl}}\cdot$
Br	Bromine	2-8-18-7	$\cdot\ddot{\text{Br}}\cdot$
I	Iodine	2-8-18-18-7	$\cdot\ddot{\text{I}}\cdot$
At	Astatine	2-8-18-32-18-7	$\cdot\ddot{\text{At}}\cdot$

Reactivity is a measure of how intense an element gains or loses electrons. The halogens gain 1 electron. Suggest a reason why fluorine would be more reactive than astatine in gaining electrons.

Fluorine is the smallest and wants to gain 1 e⁻ the most.

6. Color a box around each of the noble gases, Group 18, and lightly shade them in black because they are chemically unreactive hence the other name for this group: the inert gases

Complete the chart on the noble gases.

SYMBOL	ELEMENT NAME	ELECTRON CONFIGURATION	ELECTRON DOT
He	Helium	2	He
Ne	Neon	2-8	:Ne:
Ar	Argon	2-8-8	:Ar:
Kr	Krypton	2-8-18-8	:Kr:
Xe	Xenon	2-8-18-18-8	:Xe:
Rn	Radon	2-8-18-32-18-8	:Rn:

7. Use a fluorescent highlighter on elements 84-118 and element 43, technetium, to indicate the radioactive nature of these elements. All of elements have at least one radioactive isotope but the elements you highlighted are strictly radioactive with no stable isotopes.

Reminder: What are isotopes?

Isotopes are forms of the same element that have equal protons but a different number of neutrons.

Isotopes are related to the calculation of average atomic mass of an element. What information is necessary to determine the average atomic mass of any element? Circle all that apply.

- Atomic mass of artificially produced isotopes of that element
- Relative abundance of each isotope
- Number of protons in each atom of the sample
- Atomic mass of all the naturally occurring isotopes of that element
- Exactly 100 atoms of the element
- Number of neutrons in each isotope
- Whether the atoms of the element will gain or lose electrons

Leave this Periodic Table in your notebooks to refer to during this unit.

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554
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