

▶ Extending Concepts

Periodic Table In Exercises 23–30, use the periodic table of elements.

Period	Group																		
	1																	18	
1	H 1.008																	He 4.003	
2	Li 6.941	Be 9.012											B 10.81	C 12.01	N 14.01	O 16	F 19	Ne 20.18	
3	Na 22.99	Mg 24.31											Al 26.98	Si 28.09	P 30.97	S 32.07	Cl 35.45	Ar 39.95	
4	K 39.10	Ca 40.08	Sc 44.96	Ti 47.88	V 50.94	Cr 52	Mn 54.94	Fe 55.85	Co 58.47	Ni 58.69	Cu 63.55	Zn 65.39	Ga 69.72	Ge 72.59	As 74.92	Se 78.96	Br 79.9	Kr 83.8	
5	Rb 85.47	Sr 87.62	Y 88.91	Zr 91.22	Nb 92.91	Mo 95.94	Tc (98)	Ru 101.1	Rh 102.9	Pd 106.4	Ag 107.9	Cd 112.4	In 114.8	Sn 118.7	Sb 121.8	Te 127.6	I 126.9	Xe 131.3	
6	Cs 132.9	Ba 137.3			Hf 178.5	Ta 180.9	W 183.9	Re 186.2	Os 190.2	Ir 192.2	Pt 195.1	Au 197	Hg 200.5	Tl 204.4	Pb 207.2	Bi 209	Po (210)	At (210)	Rn (222)
7	Fr (223)	Ra (226)			Rf (257)	Db (260)	Sg (263)	Bh (262)	Hs (265)	Mt (266)	Ds (271)	Rg (272)	Uub (285)	Uut (284)	Uuq (289)	Uup (288)	Uuh (292)	Uus 0	Uuo 0
			6	La 138.9	Ce 140.1	Pr 140.9	Nd 144.2	Pm (147)	Sm 150.4	Eu 152	Gd 157.3	Tb 158.9	Dy 162.5	Ho 164.9	Er 167.3	Tm 168.9	Yb 173	Lu 175	
	7	Ac (227)	Th 232	Pa (231)	U (238)	Np (237)	Pu (242)	Am (243)	Cm (247)	Bk (247)	Cf (249)	Es (254)	Fm (253)	Md (256)	No (254)	Lr (257)			

Chemical Properties

- All discovered alkali metals react strongly with water.
- All discovered alkaline earth metals are solid at room temperature.
- All discovered noble gases are odorless.
- All actinides are radioactive.

- Write a syllogism that involves potassium (element 19). Then draw a set diagram.
- Write a syllogism that involves xenon (element 54). Then draw a set diagram.
- Write a syllogism that involves radium (element 88). Then draw a set diagram.
- Write a syllogism that involves thorium (element 90). Then draw a set diagram.
- There are hypothetical alkali metals that have not been discovered. Use inductive reasoning to draw a conclusion about all alkali metals, discovered or undiscovered.
- There are hypothetical alkaline earth metals that have not been discovered. Use inductive reasoning to draw a conclusion about all alkaline earth metals, discovered or undiscovered.
- Suppose ununennium (hypothesized element 119) is an undiscovered alkali metal. Write a syllogism that involves how ununennium reacts with water. Use your conclusion from Exercise 27 as your first premise.
- Suppose unbinilium (hypothesized element 120) is an undiscovered alkaline earth metal. Write a syllogism that involves unbinilium's state at room temperature. Use your conclusion from Exercise 28 as your first premise.



Xenon is used in high-intensity discharge headlamp bulbs.