

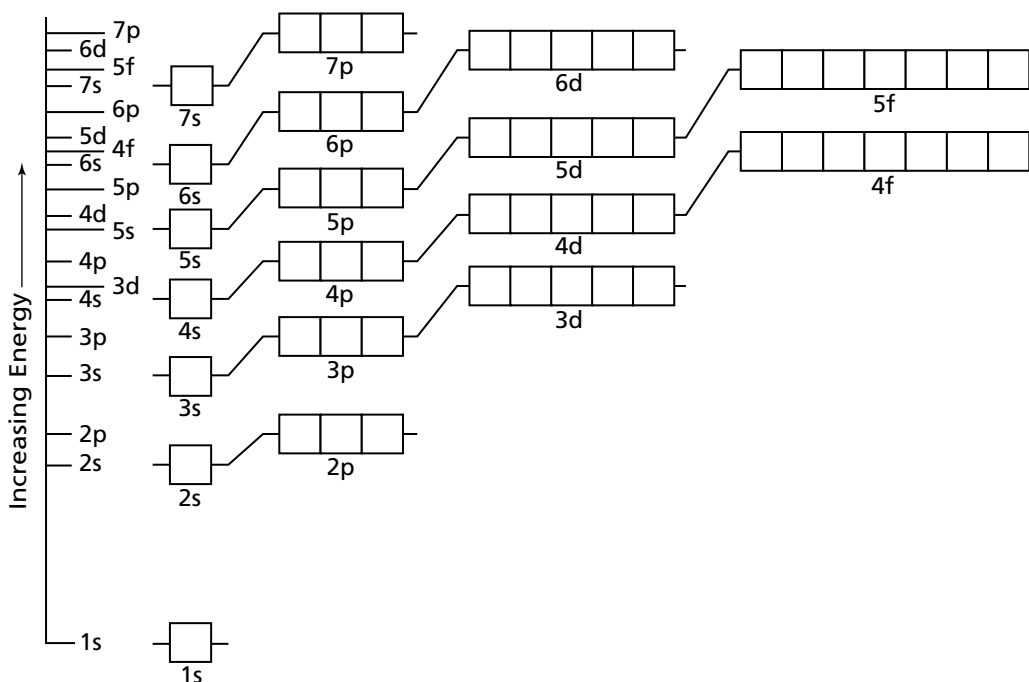
Electrons in Atoms

- Orange light has a frequency of $4.8 \times 10^{14} \text{ s}^{-1}$. What is the energy of one quantum of orange light?
- Which is greater, the energy of one photon of orange light or the energy of one quantum of radiation having a wavelength of $3.36 \times 10^{-9} \text{ m}$?
- Use the relationships $E = h\nu$ and $c = \lambda\nu$ to write E in terms of h , c , and λ .
- A radio station emits radiation at a wavelength of 2.90 m. What is the station's frequency in megahertz?
- Record the frequency of your favorite radio station. What is the wavelength of the radiation emitted from the station?
- List the sequence in which the following orbitals fill up: 1s, 2s, 3s, 4s, 5s, 6s, 7s, 2p, 3p, 4p, 5p, 6p, 7p, 3d, 4d, 5d, 6d, 4f, 5f.
- Which element has the ground-state electron configuration $[\text{Kr}]5s^24d^{10}5p^4$?
- Which element has the ground-state electron configuration $[\text{Ar}]4s^23d^{10}$?
- Write electron-dot structures for the following atoms.
 - $[\text{Ne}]3s^23p^3$
 - $[\text{Ar}]4s^23d^3$
 - potassium

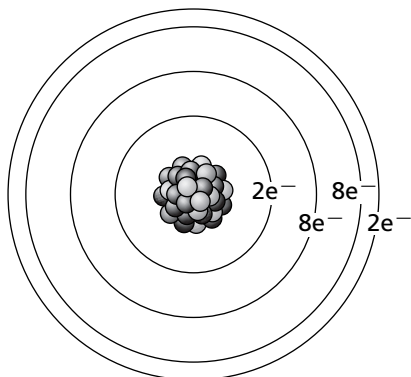
10. Complete the following table.

Element	Symbol	Orbitals					Electron Configuration
		1s	2s	2p _x	2p _y	2p _z	
a. Nitrogen							$1s^22s^22p^3$
b.	F	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	\uparrow	
c. Carbon							
d.							$1s^22s^1$

11. Complete the orbital diagram for arsenic.



12. Use the figure below to answer the following questions.



- How many valence electrons does an atom of this element have?
- What is the atom's electron-dot structure?
- If enough energy was added to remove an electron, from which energy level would the electron be removed? Explain your answer.

13. What is the ground-state electron configuration of each of the following atoms? Use noble-gas notation.

- selenium
- krypton
- chlorine

14. What is the highest energy level (n) that is occupied in the following elements?

- He
- Ca
- Sn

15. Write the electron configuration for each element described below and identify the element.

- an element that contains 8 electrons
- an element that contains 14 electrons