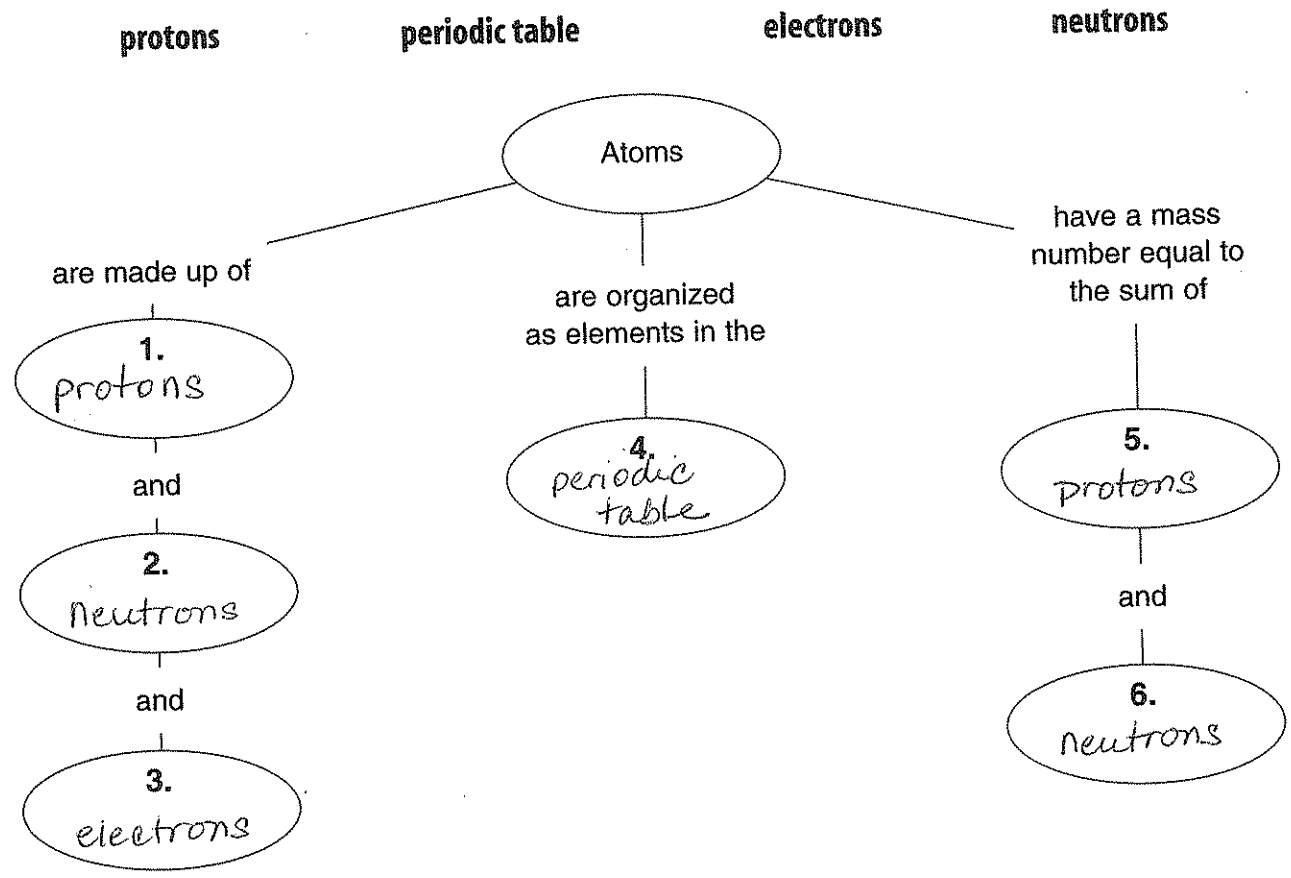


Overview Properties of Atoms and the Periodic Table

Directions: Complete the concept map using the terms in the list below. Terms can be used more than once.



Meeting Individual Needs

Properties of Atoms and the Periodic Table

- Directions:** complete the following sentences by underlining the correct words in parentheses.
- An element is matter that is composed of one type of (atom/quark).
 - The unit of measurement used for atomic particles is the (atom size/atomic mass unit).
 - Atoms of the same element that have different numbers of neutrons are called (isotopes/electron clouds).
 - In the periodic table, elements are arranged by increasing atomic (power/number).
 - An electron dot diagram uses the symbol of an element and dots to represent the (quarks/electrons) in the outer energy level.



Directed Reading for
Content Mastery

Section 1 ■ Structure of the Atom

Section 2 ■ Masses of Atoms

Directions: Use the terms below to complete the following paragraphs about atoms, atomic mass, and isotopes. Terms may be used more than once.

six number electrons isotopes electron cloud
neutron(s) proton(s) mass quarks six protons

The electron has very little mass compared to the 1. proton or 2. neutrons. The mass of the atom depends on the nucleus and how many 3. protons and 4. neutrons it has. The sum of the protons and neutrons is the mass 5. number of an atom. The number of neutrons in an atom can be found by subtracting the atomic number from the 6. mass number. The mass of the atom is so small that there is a measure called the atomic 7. mass unit designated by amu. 8. protons and 9. neutrons make up the nucleus and are made up of 10. quarks. There are 11. six uniquely different quarks. 12. Electrons are found in an area around the nucleus called the 13. electron cloud. The nuclei of all atoms of a given element always have the same number of 14. protons. They will also have the same number of 15. electrons around the nucleus. Some atoms may have more or fewer 16. neutrons than will other atoms of the same element. Atoms of the same element with different numbers of neutrons are called 17. isotopes. Every atom of carbon must contain 18. six protons but some contain six neutrons and others have eight neutrons.

Directed Reading for Content Mastery

Section 3 ■ The Periodic Table

Periodic Table of the Elements

Key

6	← Atomic number
C	← Element's symbol
Carbon	← Element's name
12.011	← Atomic mass

1—New designation

1	2											13	14	15	16	17	18	
1 H Hydrogen 1.008													5 B Boron 10.81	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180
2	3	4											13	14	15	16	17	18
3 Li Lithium 6.941	4 Be Beryllium 9.0122												13 Al Aluminum 26.98	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.06	17 Cl Chlorine 35.453	18 Ar Argon 39.948
3	11	12	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.88	23 V Vanadium 50.94	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.847	27 Co Cobalt 58.9332	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.39	31 Ga Gallium 69.72	32 Ge Germanium 72.61	33 As Arsenic 74.922	34 Se Selenium 78.96	35 Br Bromine 79.904	36 Kr Krypton 83.80	
5	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
87 Rb Rubidium 85.468	88 Sr Strontium 87.62	89 Y Yttrium 88.9059	90 Zr Zirconium 91.224	91 Nb Niobium 92.91	92 Mo Molybdenum 95.94	93 Tc Technetium 97.907	94 Ru Ruthenium 101.07	95 Rh Rhodium 102.906	96 Pd Palladium 106.42	97 Ag Silver 107.868	98 Cd Cadmium 112.41	99 In Indium 114.82	100 Sn Tin 118.710	101 Sb Antimony 121.757	102 Te Tellurium 127.60	103 I Iodine 126.904	104 Xe Xenon 131.29	
6	55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
132.905 Cs Cesium	137.327 Ba Barium	138.906 La Lanthanum	178.49 Hf Hafnium	180.95 Ta Tantalum	183.85 W Tungsten	186.207 Re Rhenium	190.2 Os Osmium	192.22 Ir Iridium	195.08 Pt Platinum	196.967 Au Gold	200.59 Hg Mercury	204.383 Tl Thallium	207.2 Pb Lead	208.98 Bi Bismuth	208.982 Po Polonium	209.987 At Astatine	222.010 Rn Radon	
7	87	88	89	104	105	106	107	108	109	110	111	112	114	116				
223.020 Fr Francium	226.025 Ra Radium	227.029 Ac Actinium	(261) Rf Rutherfordium	(262) Db Dubnium	(263) Sg Seaborgium	(263) Bh Bohrium	(264) Hs Hassium	(265) Mt Meitnerium	(266) Uun Ununium	(269) Uuu Ununium	(272) Uub Unubium	(285) Uuq Ununquadium	(289) Uuh Ununhexium	(293) Uuo Ununodum				

Rare-Earth Elements													
58 Ce Cerium 104.115	59 Pr Praseodymium 140.908	60 Nd Neodymium 144.24	61 Pm Promethium 144.913	62 Sm Samarium 150.36	63 Eu Europium 151.965	64 Gd Gadolinium 157.25	65 Tb Terbium 158.925	66 Dy Dysprosium 162.50	67 Ho Holmium 164.93	68 Er Erbium 167.26	69 Tm Thulium 168.934	70 Yb Ytterbium 173.04	71 Lu Lutetium 174.967
90 Th Thorium 232.038	91 Pa Protactinium 231.036	92 U Uranium 238.029	93 Np Neptunium 237.048	94 Pu Plutonium 244.064	95 Am Americium 243.061	96 Cm Curium 247.070	97 Bk Berkelium 247.070	98 Cf Californium 251.080	99 Es Einsteinium 252.083	100 Fm Fermium 257.095	101 Md Mendelevium 258.099	102 No Nobelium 259.101	103 Lr Lawrencium 260.105

Lanthanide Series →

Actinide Series →

Meeting Individual Needs

Directions: Use the periodic table above to answer the following questions.

- List two types of information that are given in each box of this periodic table.
 - symbol
 - atomic number
- In this table, where are the metals located? left side
- Where are the nonmetals located? right side
- What are the elements in Groups 3 through 12 called? transition elements
- What are the elements called that are next to the staircase-shaped line on the right side of the table? metalloids
- What do we call the letter or letters that represents an element?
chemical symbol
- How many elements are included in the modern periodic table? 115 w/ 3 blank spaces
- What name is given to the elements in Group 18? unreactive



Directed Reading for
Content Mastery

Key Terms Properties of Atoms and the Periodic Table

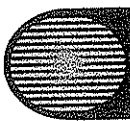
Directions: Match the term in Column II with the definition in Column I. Write the letter of the correct term in the blank at the left.

Column I

- g 1. sum of the number of protons and neutrons in the nucleus
- j 2. region around the nucleus where the electrons are found
- a 3. positively charged center of an atom
- n 4. vertical column in the periodic table
- d 5. neutral particles in the nucleus of an atom
- i 6. weighted average mass of the mixture of its isotopes
- c 7. positively charged particles in an atom
- k 8. table of the elements arranged according to repeated changes in properties
- o 9. represents the electrons in the outer energy level of an element
- b 10. negatively charged particles in an atom
- h 11. atoms of the same element that have different numbers of neutrons
- f 12. number of protons in an atom's nucleus
- p 13. horizontal row in the periodic table
- e 14. smallest known particle that makes up protons and neutrons
- l 15. the smallest piece of matter that still retains the properties of the element
- q 16. developed an early periodic chart
- m 17. approximately 1.67×10^{-24} g

Column II

- a. nucleus
- b. electrons
- c. protons
- d. neutrons
- e. quark
- f. atomic number
- g. mass number
- h. isotope
- i. average atomic mass
- j. electron cloud
- k. periodic table
- l. atom
- m. atomic mass unit
- n. group
- o. electron dot diagram
- p. period
- q. Dmitri Mendeleev



Chapter Review

Properties of Atoms and the Periodic Table

Part A. Vocabulary Review

Directions: On the space at the left, write the term that correctly completes each statement. Use each term once.

metals	isotopes	average atomic mass	electron cloud
groups	metalloids	transition elements	atomic number
electrons	nucleus	mass number	periods
chemical symbol	quarks	periodic table	

- Chemical symbol 1. A capital letter or a combination of a capital letter and a small letter that is used to represent an element is called a(n) _____.
- periods 2. The horizontal rows of elements are called _____.
- avg. atomic mass 3. An average of the masses of all the isotopes that occur in nature for an element is the _____.
- groups 4. Vertical columns of elements are called _____.
- transition elements 5. Elements in the middle of the periodic table, groups 4 through 7, are called the _____.
- atomic number 6. The number of protons in an atom is the _____.
- quarks 7. Protons and neutrons can be subdivided into _____ by colliding them.
- nucleus 8. The center of an atom where protons and neutrons are located is the _____.
- mass number 9. A total count of the neutrons and protons in an atom is the _____.
- isotopes 10. Atoms of the same element but with different numbers of neutrons are _____.
- metals 11. Elements that are found on the left side of the periodic table are _____.
- metalloids 12. Elements that have some properties of both metals and nonmetals are _____.
- electrons 13. The particles that move about the nucleus and have a negative charge are _____.
- electron cloud 14. The region around the nucleus occupied by electrons is a(n) _____.
- periodic table 15. A chart that shows the classification of elements is called the _____.

