

Understanding the Atom

Lesson 3 Elements, Isotopes, and Ions—How Atoms Differ



Grade 8 Science Content Standards—3.f: Students know how to use the periodic table to identify elements in simple compounds. Also covers: 7.b

Scan Lesson 3 of your book. Read the headings and look at the illustrations. Predict three topics that will be discussed.

1. _____
2. _____
3. _____

Review Vocabulary

periodic table

Define periodic table using your book or a dictionary.

New Vocabulary

Read the definitions below. Write the correct vocabulary term on the blank to the left of each definition.

total mass of an atom

pure substance made from atoms that all have the same number of protons

number of protons in an atom of an element

atom that has gained or lost electrons and is no longer neutral

sum of the number of protons and neutrons that an atom has

atoms of the same element that have different numbers of neutrons

Academic Vocabulary

positive

Use your book or a dictionary to define positive as it is used in science. Then write the term that has the opposite meaning.

Lesson 3 Elements, Isotopes, and Ions—How Atoms Differ (continued)

Main Idea

**Different Elements—
Different Numbers of Protons**

I found this information on page _____.

Atomic Number and the Periodic Table

I found this information on page _____.

**Isotopes—
Different Numbers of Neutrons**

I found this information on page _____.

Details

Sequence the elements gold, copper, and sulfur in order by the number of protons in their nuclei. Write the atomic number for each element.

1. Element: _____ Atomic number: _____
2. Element: _____ Atomic number: _____
3. Element: _____ Atomic number: _____

Model the periodic table. Shade the metals, nonmetals, and metalloids. Then draw and label an arrow to show how atomic number changes as you move across a row of the table.

Periodic Table of Elements

1	2											13	14	15	16	17	18							
1	H											5	B	6	C	7	N	8	O	9	F	10	Ne	
2	3	4											13	Al	14	Si	15	P	16	S	17	Cl	18	Ar
3	11	12	3	4	5	6	7	8	9	10	11	12	13	Al	14	Si	15	P	16	S	17	Cl	18	Ar
4	19	20	21	22	23	24	25	26	27	28	29	30	31	Ga	32	Ge	33	As	34	Se	35	Br	36	Kr
5	37	38	39	40	41	42	43	44	45	46	47	48	49	In	50	Sn	51	Sb	52	Te	53	I	54	Xe
6	55	56	57	72	73	74	75	76	77	78	79	80	81	Tl	82	Pb	83	Bi	84	Po	85	At	86	Rn
7	87	88	89	104	105	106	107	108	109	110	111	112	114	Uuq	116	Uuh	118	Uuo						
			58	59	60	61	62	63	64	65	66	67	68	69	70	71								
			Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu								
			90	91	92	93	94	95	96	97	98	99	100	101	102	103								
			Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr								

Create a drawing showing two isotopes of neon with mass numbers of 20 and 22. Neon has an atomic number of 10.

SUMMARIZE IT

Summarize two main ideas from the above sections.

Lesson 3 Elements, Isotopes, and Ions—How Atoms Differ (continued)

Main Idea

I found this information on page _____.

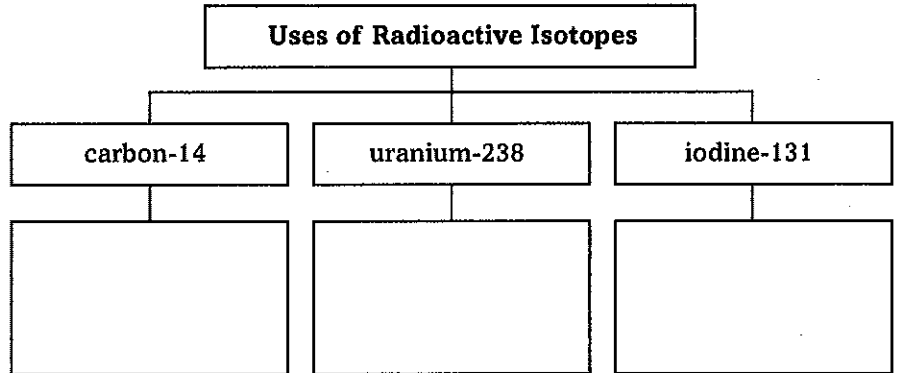
I found this information on page _____.

Ions—Gaining or Losing Electrons

I found this information on page _____.

Details

Summarize uses of some radioactive isotopes in the concept map.



Organize information about the 3 main isotopes of hydrogen. List the mass number and number of neutrons for each. Put a check mark by the radioactive isotope.

Protium: _____

Deuterium: _____

Tritium: _____

Contrast positive and negative ions. Draw an example of each. Then complete the rest of the table.

	Positive Ion	Negative Ion
Sketch		
Formed when		

SUMMARIZE IT

Summarize the main ideas of the above sections.

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Chapter Wrap-Up

Review the ideas you listed in the table at the beginning of the chapter. Cross out any incorrect information in the first column. Then complete the table by filling in the third column.

K What I know	W What I want to find out	L What I learned

Review

Use this checklist to help you study.

- Review the information you included in your Foldable.
- Study your *Science Notebook* on this chapter.
- Study the definitions of vocabulary words.
- Review daily homework assignments.
- Re-read the chapter and review the charts, graphs, and illustrations.
- Review the Standards Check at the end of each lesson.
- Look over the Standards Review at the end of the chapter.

SUMMARIZE IT

After reading the chapter, write one or two sentences to summarize the main ideas of each section.
