Name _____ Date _____ Class _____

CHAPTER 3

TEKS/TAKS TEST PREPARATION FOR SCIENCE

Practice Test A TEKS

1 An atom's energy levels are

A regions in the atom's nucleus where electrons can be found.

B regions around the atom's nucleus where neutrons are located.

C regions between atoms where protons are located.

D regions around the nucleus of an atom where electrons are located.

2 You are studying a sample of an element. You determine that the element's atoms have seven valence electrons. Select the statement that best describes the element's properties.

F The element is a noble gas, so it is unreactive.

G The element is a transition metal, so it is shiny and is a good conductor of thermal energy and electric current.

H The element is a halogen, so it is unreactive.

J The element is a halogen, so it is a nonmetal, is very reactive, and is a poor conductor of electric current.

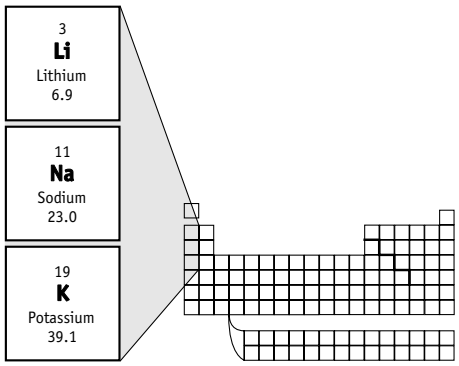
3 An atom of an element in Group 16 has how many valence electrons?

A 6

B 8

C 16

D 26



4 These elements are grouped together on the periodic table because they

F are listed alphabetically.

G are all transition metals.

H are noble gases.

J have the same number of valence electrons.

5 An atom is the smallest particle of an element that still retains all the properties of that element. Which best completes the description of an atom?

A An atom has electrons that can be found in one or more energy levels outside the atom's nucleus.

B The number of electrons an atom has is always different from the number of protons it has.

C The total number of electrons in an atom is equal to the number of protons plus the number of neutrons.

D Every atom has a nucleus, which is usually made up of protons and neutrons, surrounded by energy levels containing one or more electrons.

Name _____ Date _____ Class _____

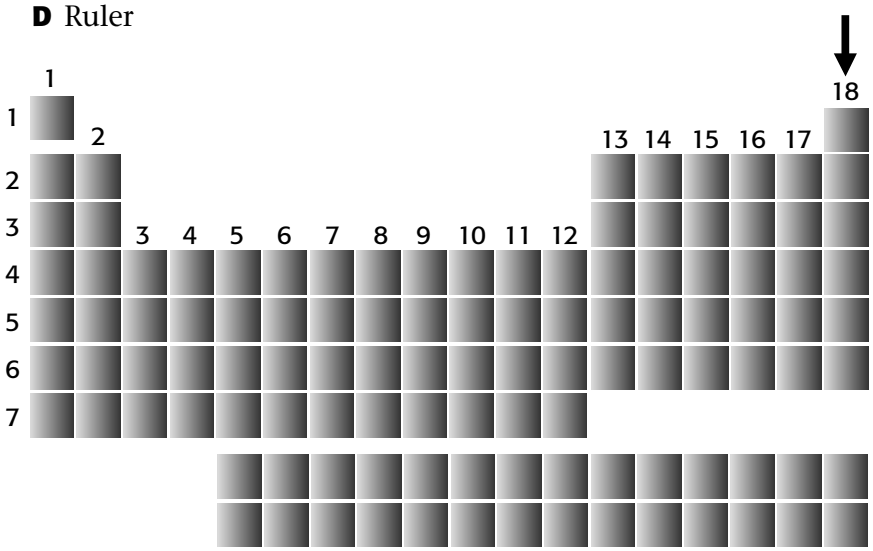
CHAPTER 3 TEKS/TAKS TEST PREPARATION FOR SCIENCE

Practice Test B TEKS

1 An element is located on the periodic table according to
- **A** when it was discovered.
- **B** its chemical symbol.
- **C** its chemical name.
- **D** its physical and chemical properties.

2 The property that determines how an atom of an element reacts with other atoms is the atom's
- **F** number of valence electrons.
- **G** number of protons.
- **H** number of neutrons.
- **J** atomic mass.

3 During a laboratory experiment, which piece of equipment would be used to measure the volume of mercury?
- **A** Spring scale
- **B** Graduated cylinder
- **C** Balance
- **D** Ruler

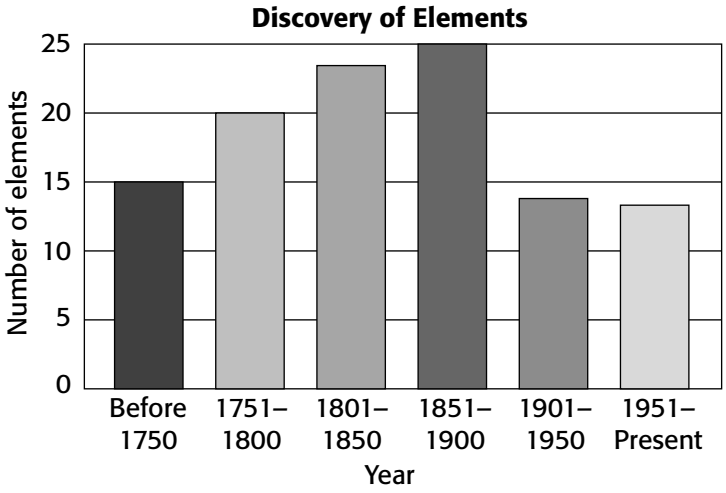


4 Look at the drawing of the periodic table shown above. The elements found in Group 18 have
- **F** 6 valence electrons.
- **G** 16 valence electrons.
- **H** 8 valence electrons.
- **J** 18 valence electrons.

Name _____ Date _____ Class _____

5 Which of the following elements do not usually react with other elements?

A Carbon group
B Noble gases
C Halogens
D Alkali metals



6 The chart above shows the number of elements discovered during different periods of time. The greatest number of elements were discovered

F before 1750.
G between 1801–1850.
H between 1851–1900.
J from 1951–present.

7 According to the chart above, how many elements were discovered between 1751–1800?

A 25
B 20
C 15
D 10

8 An atom that has 12 protons, 14 neutrons, and 12 electrons has an atomic number of

F 12.
G 14.
H 26.
J 38.

Name _____ Date _____ Class _____

Transition Metals

Element	Uses
Iron (Fe)	Manufacturing, building materials, dietary supplements
Cobalt (Co)	Magnets, heat-resistant tools
Nickel (Ni)	Coins, batteries, jewelry, plating
Copper (Cu)	Electric wiring, plumbing, motors
Silver (Ag)	Jewelry, dental fillings, mirror backing, electric conductor
Gold (Au)	Jewelry, base for money systems, coins, dentistry

9 Tina created the chart above after a field investigation about transition metals and their uses. According to the chart, which of the following metals is NOT used for making jewelry?

A Nickel
B Silver
C Gold
D Cobalt

10 Why are most transition metals in the chart above better than alkali metals for making jewelry?

F Transition metals are gases at room temperatures.
G Some transition metals produce a magnetic field.
H Transition metals are less reactive than alkali metals.
J Transition metals are silver-colored.

11 Which property of cobalt makes it attract or repel some other metals?

A Cobalt produces a magnetic field.
B Cobalt is liquid at room temperature.
C Cobalt is a good conductor of thermal energy.
D Cobalt has a high melting point.

12 Where are an atom's valence electrons located?

F In the innermost energy level of an atom
G In the outermost energy level of an atom
H In every energy level of an atom
J Throughout the entire atom

Name _____ Date _____ Class _____

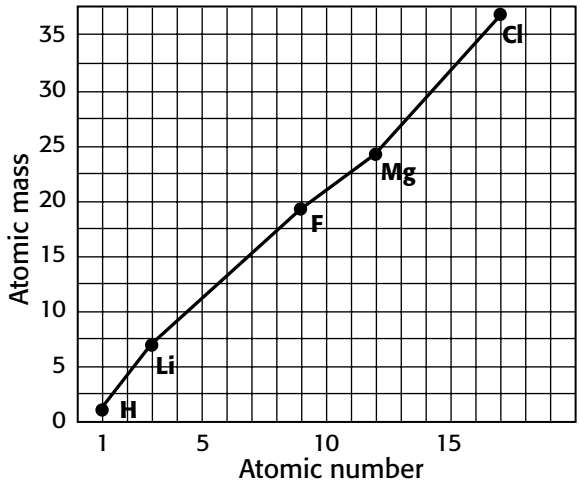
13 Why are the nonmetals grouped together?

A They are completely unreactive.

B They are all part of the same period.

C They all have the same number of valence electrons.

D They share some physical properties.



14 The graph above shows the atomic numbers and atomic masses of 5 elements on the periodic table. According to the graph, the element with an atomic mass of 24 is

F magnesium (Mg).

G lithium (Li).

H fluorine (F).

J chlorine (Cl).

15 According to the graph above, what relationship exists between an atom's atomic number and atomic mass?

A As atomic number increases, atomic mass decreases.

B As atomic number increases, atomic mass increases.

C There is no relationship between atomic number and atomic mass.

D Some atoms have no atomic mass.

16 Lydia made a hypothesis that all metals were solids at room temperature. Is her hypothesis correct?

F No; mercury is a metal, but is liquid at room temperature.

G No; the noble gases in Group 18 are metals.

H No; iron is a metal but is a gas at room temperature.

J Yes; all metals are solids at room temperature.

Name _____ Date _____ Class _____

17 In the current periodic table, elements in a family or group generally have

A the same number of neutrons in their nuclei.

B the same total number of electrons in their electron clouds.

C the same atomic mass.

D the same number of valence electrons.

7	8	9
N	**O**	**F**
Nitrogen	Oxygen	Fluorine
14.007	15.999	18.998

18 The drawing above shows three squares from the periodic table. What is the mass number of the element nitrogen?

F 15.999 amu

G 14.007 amu

H 7 amu

J 8 amu

19 According to the drawing above, what is the atomic number of fluorine?

A 9

B 8

C 18.998

D 15.999

20 Which of these statements about a group of elements is TRUE?

F The elements have a wide range of properties.

G The elements have the same atomic number.

H The elements have similar properties.

J The elements have the same mass number.

CHAPTER 3

Answer Key and TAKS Doctor for Practice Test A

Answers	TEKS Correlation	TAKS Objectives
1 D	8.8A	4
2 J	8.9B	4
3 A	8.9B	4
4 J	8.9B	4
5 D	8.8A	4

The following TAKS questions have been diagnosed by the TAKS Doctor. Find out what might be causing your "ailing" answers. The TAKS Doctor will see you now!

Item 1 *asks students to define the term energy level.*

A **Incorrect.** Energy levels are regions in an atom, but not in an atom's nucleus. In addition, electrons are not found in an atom's nucleus.

B **Incorrect.** Energy levels are regions around the nucleus, but neutrons are part of the nucleus, not in energy levels.

C **Incorrect.** Energy levels are regions within an atom, not between atoms. In addition, protons are particles that make up the nucleus and are not in energy levels.

D **Correct.** Energy levels are outside the nucleus, and they contain electrons.

Item 2 *asks students to interpret information on the periodic table to place an element in its proper group and to select the statement that gives properties of that group.*

F **Incorrect.** The element cannot be a noble gas because noble gases have eight valence electrons (except for helium, which has only two).

G **Incorrect.** The element cannot be a transition metal because transition metals have one or two valence electrons.

H **Incorrect.** The element is a halogen, but halogens are not unreactive.

J **Correct.** The element is a halogen and has the properties listed.

Item 5 *asks students to choose the best description of the structure and parts of an atom.*

A **Incorrect.** This description is incomplete because it describes only electrons.

B **Incorrect.** This description is incomplete because it does not describe the structure of an atom. The description is also incorrect because atoms of elements have the same numbers of electrons and protons.

C **Incorrect.** The total number of electrons in an element's atoms is equal only to the number of protons.

D **Correct.** This answer best describes the structure of an atom.

Answer Key and TAKS Doctor for Practice Test B

Answers		TEKS Correlation	TAKS Objectives	Answers		TEKS Correlation	TAKS Objectives
1	D	8.9B	4	**11**	A	8.2C	1
2	F	8.8B	4	**12**	G	8.8A	4
3	B	8.4A	1	**13**	D	8.9B	4
4	H	8.9B	4	**14**	F	8.8B	4
5	B	8.9B	4	**15**	B	8.8B	4
6	H	8.3E	1	**16**	F	8.3A	1
7	B	8.3E	1	**17**	D	8.9B	4
8	F	8.8B	4	**18**	G	8.8B	4
9	D	8.2C	1	**19**	A	8.8B	4
10	H	8.2C	1	**20**	H	8.9B	4

The following TAKS questions have been diagnosed by the TAKS Doctor. Find out what might be causing your "ailing" answers. The TAKS Doctor will see you now!

Item 2 *asks students to identify the property that determines how an atom reacts with other atoms.*

F **Correct.** The number of electrons in an atom's outermost energy level determines how that atom will react with other atoms.

G **Incorrect.** The number of protons in an atom's nucleus is usually the same as the total number of electrons the atom has, but the protons do not determine an atom's reactivity with other atoms.

H **Incorrect.** Neutrons, which carry no charge and are found in an atom's nucleus, do not determine an atom's reactivity with other atoms. The number of neutrons an atom has can vary.

J **Incorrect.** Atomic mass is a property of elements. The atomic mass of an element is the weighted average of the masses of all the naturally occurring isotopes of an element. Atomic mass does not determine an atom's reactivity.

Item 4 *asks the students to interpret information on the periodic table to determine a relationship between a group of elements on the periodic table and the number of valence electrons found in that group of elements.*

F **Incorrect.** The elements of group 18 have 8 valence electrons, not 6 valence electrons.

G **Incorrect.** The elements of group 18 have 8 valence electrons, not 16 valence electrons.

H **Correct.** The elements of group 18 have 8 valence electrons. The number 10 can be subtracted from the 18 to show that the elements in group 18 have 8 valence electrons.

J **Incorrect.** The number 18 is the group number of this family of elements and not the number of valence electrons that each of these elements has.

Item 5 *asks students to identify which elements do not usually react with other elements.*

A **Incorrect.** Members of the carbon group react with a wide variety of other elements to form important compounds. For example, carbon is found in proteins, carbohydrates, and fats, and silicon is used with other elements to make computer chips and glass.

B **Correct.** The noble gases are called "noble" because they generally don't mix or react with other elements. Noble gases have filled outermost energy levels and do not need to gain or lose electrons.

C **Incorrect.** Halogens are the most reactive nonmetals. They need to gain only one electron to fill their outermost energy level, so they are very reactive.

D **Incorrect.** Alkali metals are the most reactive metals. They need to lose only one electron to have a full outermost energy level, so they are very reactive.

Item 6 *asks students to draw a valid conclusion by interpreting information from a graph.*

F **Incorrect.** The bar for the period before 1750 is much shorter than the bar for the period 1851–1900. The graph shows that only 15 elements were discovered in the period before 1750.

G **Incorrect.** Although the bar for the period 1801–1850 is almost the same height as the one for 1851–1900, it is shorter and shows that fewer than 25 elements were discovered.

H **Correct.** The bar for the period 1851–1900 is the tallest bar on the graph, and shows that 25 elements were discovered during this period, which is more than during any other period shown.

J **Incorrect.** The bar for the period 1951–present is much shorter than the bar for the period 1851–1900. Fewer than 15 elements were discovered in this period.

Item 9 *asks students to use information on a chart to identify the element that has a certain property.*

A **Incorrect.** The information in the chart shows that nickel is used for jewelry.

B **Incorrect.** The information in the chart shows that silver is used for jewelry.

C **Incorrect.** The information in the chart shows that gold is used for jewelry. (Many students will already know that gold is used in jewelry.)

D **Correct.** The information in the chart shows that jewelry is not one of the uses of cobalt.

Item 11 *asks students to identify the property of cobalt that makes it attract or repel other metals.*

A **Correct.** According to the chart, cobalt is used to make magnets. Cobalt produces a magnetic field and therefore attracts or repels some other metals.

B **Incorrect.** Cobalt is a solid, not a liquid, at room temperature. However, cobalt's physical state (solid) is not the property that makes it attract or repel other metals.

C **Incorrect.** Most metals are good conductors of thermal energy. If this answer were correct, many metals would attract or repel other metals. Most metals do not attract or repel other metals, so this answer cannot be correct.

D Incorrect. A metal's melting point is not related to whether it attracts or repels other metals.

Item 14 *asks students to draw a valid conclusion by interpreting information from a graph.*

F Correct. According to the graph, the element whose atomic mass is 24 (at a point a little below the line for atomic mass 25) is magnesium (Mg).

G Incorrect. According to the graph, the point for the atomic mass of lithium (Li) is a little below the line for atomic mass 7.5.

H Incorrect. According to the graph, the point for the atomic mass of fluorine (F) is a little below the line for atomic mass 20.

J Incorrect. According to the graph, the point for the atomic mass of chlorine (Cl) is above the line for atomic mass 35.

Item 15 *asks students to use the graph to infer the relationship between two properties of elements.*

A Incorrect. The shape of the graph (the upward-sloping line) shows that there is a relationship between atomic number and atomic mass, and shows that as the atomic numbers of the elements listed get larger, the atomic masses of the elements also increase.

B Correct. The shape of the graph shows that there is a relationship between atomic number and atomic mass. As the atomic numbers of the elements listed get larger, the values of their atomic masses also increase.

C Incorrect. The shape of the graph shows that there is a relationship between atomic number and atomic mass. In this case, as the atomic numbers of the elements listed get larger, the values of their atomic masses also increase.

D Incorrect. Nothing on the graph supports this answer.

Item 17 *asks students to identify what property is shared by elements in a group in the periodic table.*

A Incorrect. Elements are grouped together because they exhibit similar chemical and physical properties. The number of neutrons any one atom can have varies; neutrons do not determine chemical or physical properties.

B Incorrect. Elements are grouped together because they exhibit similar chemical and physical properties. These properties are determined by the number of valence electrons an atom of an element has, not the total number of electrons that it has.

C Incorrect. Elements are grouped together because they exhibit similar chemical and physical properties. These properties are determined by the number of valence electrons that an atom of an element has, not the atom's atomic mass (which is related to the total number of protons, neutrons, and electrons an atom has).

D Correct. Elements are grouped together because they exhibit similar chemical and physical properties. The number of valence electrons that an atom of an element has determines these properties.

Item 18 *asks students to read a portion of the periodic table and to apply information provided by the table.*

F **Incorrect.** This is the atomic mass of oxygen, not of nitrogen.

G **Correct.** The atomic mass of nitrogen is 14.007.

H **Incorrect.** This is the atomic number of nitrogen, not the atomic mass.

J **Incorrect.** This is the atomic number of oxygen, not the atomic mass of nitrogen.

Item 20 *asks students to determine what characteristic a family of elements has in common.*

F **Incorrect.** Elements within a family have similar physical and chemical properties.

G **Incorrect.** Different elements do not have the same atomic number.

H **Correct.** Elements within a family have similar properties.

J **Incorrect.** Different elements do not have the same mass number.