Name_____ Date_____ Class _____

CHAPTER 3

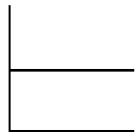
TAKS TEST PREPARATION FOR MATH IN SCIENCE

Math Mini-Test TEKS

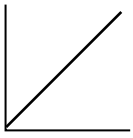
Section 1

1 An element's atomic number is determined by the number of protons in the nucleus of an atom. If the elements are plotted on a graph with increasing atomic numbers on the x-axis and the number of protons on the y-axis, a pattern emerges. Which graph represents this pattern?

A



B



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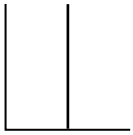
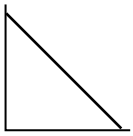


D



2 A triangle has two angles that measure 85°and 20°. The final angle in the triangle must measure

F 255°.

G 165°.

H 85°.

J 75°.

3 What is demonstrated by the two graphs below?

A Translation

B Dilation

C Reflection

D Reduction

4 Mariah's sunflower plant is $\frac{1}{5}$ the height of her sister's plant. If Mariah's plant is 15 cm tall, how tall is her sister's plant?

F 3 cm

G $15\frac{1}{5}$ cm

H 20 cm

J 75 cm

5 What is the value of x if $\frac{4x}{7} = 8$?

A 14

B $\frac{32}{7}$

C $\frac{1}{4}$

D 52

STOP

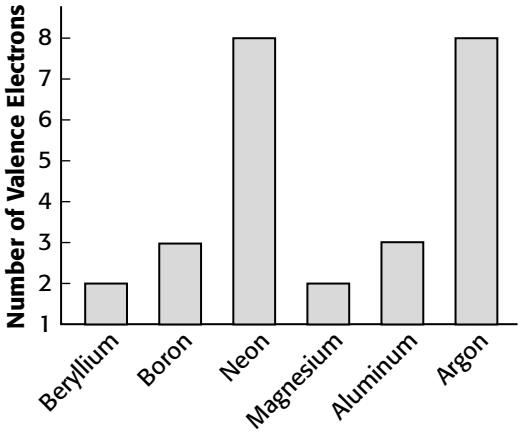
Name_____ Date_____ Class _____

CHAPTER 3 TAKS TEST PREPARATION FOR MATH IN SCIENCE

Math Mini-Test TEKS

Section 2

1



Beryllium is located directly above magnesium on the periodic table; and boron is located above aluminum. If krypton is located directly below argon, what would you expect its valence number to be, based on the graph above?

A 2
B 8
C 16
D 9

2 Which of these conclusions can NOT be drawn from the data in the graph above?

F Neon has 8 valence electrons.
G Aluminum has 3 valence electrons.
H Different elements can have the same number of valence electrons.
J Beryllium has the same total number of electrons as magnesium.

3 Alex needs to put books away in a bookcase with 3 shelves. The bottom shelf can hold 10 books, the second shelf can hold 8 books, and the third shelf can hold 4 books. If Alex has 25 books, how many books will he have left over?

A 0
B 3
C 7
D 25

4 A portion of the periodic table is shown below with metalloids shaded in grey. What fraction of the elements shown are metalloids?

5 **B** Boron 10.8	6 **C** Carbon 12.0	7 **N** Nitrogen 14.0	8 **O** Oxygen 16.0	9 **F** Fluorine 19.0
13 **Al** Aluminum 27.0	14 **Si** Silicon 28.1	15 **P** Phosphorus 31.0	16 **S** Sulfur 32.1	17 **Cl** Chlorine 35.5
31 **Ga** Gallium 69.7	32 **Ge** Germanium 72.6	33 **As** Arsenic 74.9	34 **Se** Selenium 79.0	35 **Br** Bromine 79.9
49 **In** Indium 114.8	50 **Sn** Tin 118.7	51 **Sb** Antimony 121.8	52 **Te** Tellurium 127.6	53 **I** Iodine 126.9
81 **Tl** Thallium 204.4	82 **Pb** Lead 207.2	83 **Bi** Bismuth 209.0	84 **Po** Polonium (209.0)	85 **At** Astatine (210.0)

The shaded elements are metalloids.

F $\frac{6}{25}$
G $\frac{19}{25}$
H $\frac{1}{25}$
J $\frac{25}{1}$

STOP

Name_____ Date_____ Class _____

CHAPTER 3 TAKS TEST PREPARATION FOR READING IN SCIENCE

Reading Mini-Test TEKS

Section 1

Read the passage. Then read each question that follows the passage. Decide which is the best answer to each question.

Each energy level can hold a specific number of electrons. For example, the first energy level (the level closest to the nucleus) can hold 2 electrons. The second energy level can hold 8 electrons, and the third energy level can hold 18 electrons. Generally, electrons will enter outer energy levels only after the inner levels are full.

The outermost energy level of most atoms is not full. The electrons in the outermost energy level of an atom are called valence electrons. Valence electrons are important because they determine how an element will react with other substances.

1 What is the meaning of level in the passage?

- **A** A device used to judge the evenness of a surface
- **B** Relative position
- **C** Filled evenly to the top
- **D** Rational and sensible

2 According to the passage, if an atom had 3 electrons, they would probably be located in

- **F** the first energy level only.
- **G** the first and second energy levels only.
- **H** the first, second, and third energy levels only.
- **J** the first, second, third, and fourth energy levels.

3 What is the main idea of the first paragraph?

- **A** Valence electrons are located in the outermost energy level.
- **B** Each atom will hold only a given number of electrons at each energy level.
- **C** The third energy level holds 18 electrons.
- **D** The nucleus can hold up to 2 electrons.

4 The electrons in the outermost energy level probably have a special name (valence electrons) because they

- **F** are closest to the nucleus.
- **G** hold 18 electrons.
- **H** are negatively charged.
- **J** determine how an element reacts with other substances.

STOP

Name_____ Date_____ Class _____

CHAPTER 3 TAKS TEST PREPARATION FOR READING IN SCIENCE

Reading Mini-Test TEKS

Section 2

Read the passage. Then read each question that follows the passage. Decide which is the best answer to each question.

The most reactive metals are the elements in Groups 1 and 2. What makes an element reactive? The answer has to do with the number of valence electrons each of its atoms has. If the atoms' outer energy levels are full, the atoms are stable and do not react easily. But when outer energy levels are not full, atoms react by gaining, losing, or sharing valence electrons.

Elements whose atoms gain, lose, or share electrons are reactive, and they combine to form compounds. Elements whose atoms need to gain, lose, or share only one or two electrons to have a filled outer level tend to be very reactive.

1 Which statement can be inferred from the passage?

- **A** Valence electrons are not interesting to scientists.
- **B** Atoms are made up of valence electrons and compounds.
- **C** The outer energy levels of the elements in Groups 1 and 2 are not full.
- **D** Atoms with a filled outer level are very reactive.

2 What is the main idea of the first paragraph?

- **F** The reactivity of an element depends on how full its outer energy levels are.
- **G** Group 2 contains the least reactive of the metals.
- **H** Stable atoms do not react easily.
- **J** Reactive elements are those which do not gain, lose, or share electrons.

3 According to the passage, which of these would probably be the most reactive?

- **A** An element that needs to lose 3 electrons to have a full outer energy level
- **B** An element that needs to lose 1 electron to have a full outer energy level
- **C** An element with a full outer energy level
- **D** An element that needs to gain 4 electrons to have a full outer energy level

4 After two very reactive atoms have combined to form a compound, they are probably

- **F** in Group 1.
- **G** known as valence electrons.
- **H** less stable than they were before.
- **J** more stable than they were before.

STOP

CHAPTER 3

TAKS TEST PREPARATION FOR MATH IN SCIENCE

Answer Key and TAKS Doctor for Mini-Tests

Section 1

Answers	TEKS Correlation	TAKS Objectives
1 B	M 8.5A	2
2 J	M 8.2B	1
3 A	M 8.6B	3
4 J	M 8.2D	1
5 A	M 8.2A	1

TAKS Doctor

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 find the measure of the third angle in a triangle.*

F **Incorrect.** This answer is the result of incorrectly assuming that there are 360° in a triangle, and subtracting the sum of 85° and 20° from 360°. However, there are only 180° in a triangle.

G **Incorrect.** This answer is found by subtracting 85° and 20° from 270° instead of 180°.

H **Incorrect.** This answer is the result of incorrectly assuming that the triangle has two angles that are the same.

J **Correct.** The sum of all three angles in a triangle is always 180°. By adding the two given angles (85°+ 20° = 105°) and subtracting that sum from 180° (180°−105° = 75°) the size of the third angle can be determined.

Item 4 *asks students to find the height of a plant given the height of a plant that is* $\frac{1}{5}$ *as tall.*

F **Incorrect.** This answer is the result of dividing the height of Mariah's plant by 5. Because Mariah's plant is a fraction of the height of her sister's plant, her sister's plant cannot be smaller than Mariah's plant. This answer cannot be correct.

G **Incorrect.** This answer is the result of adding $\frac{1}{5}$ to the height of Mariah's plant rather than calculating how tall a plant would be if $\frac{1}{5}$ of the plant is 15 cm.

H **Incorrect.** This answer is the result of adding 5 cm to the height of Mariah's plant rather than comparing the plants using the given proportion.

J **Correct.** If Mariah's plant is $\frac{1}{5}$ as tall as her sister's plant, Mariah's sister's plant must be 5 times as tall as Mariah's plant. 5 × 15 cm = 75 cm

CHAPTER 3 TAKS TEST PREPARATION FOR MATH IN SCIENCE

Answer Key and TAKS Doctor for Mini-Tests

Section 2

Answers	TEKS Correlation	TAKS Objectives
1 B	M 8.5A	2
2 J	M 8.5A, 8.13B	2, 5
3 B	M 8.14A	6
4 F	M 8.4	

TAKS Doctor

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 determine the solution to the problem using information from the graph.*

F **Incorrect.** The graph shows the number of valence electrons for each element. It can be determined from the graph that neon has 8 valence electrons.

G **Incorrect.** The graph shows the number of valence electrons for each element. The graph shows that aluminum has 3 valence electrons.

H **Incorrect.** The graph shows sets of elements that have the same number of valence electrons. This conclusion can be drawn from the graph.

J **Correct.** The graph shows valence electrons only. It does not show the total number of electrons in each element. Therefore, this conclusion cannot and should not be drawn from the graph.

Item 4 *asks students to determine what fraction of the elements on the periodic table shown are metalloids.*

F **Correct.** There are 25 elements shown. Of those, 6 are metalloids, so $\frac{6}{25}$ are metalloids.

G **Incorrect.** This answer would be correct if the question asked for the fraction of elements that are not metalloids. $25 - 6 = 19$

H **Incorrect.** This answer is the result of correctly placing 25 in the denominator of the fraction because there are 25 total elements. However, it does not correctly indicate the number of metalloids. There are 6 metalloids shown, not 1.

J **Incorrect.** This fraction, which is equal to 25, provides the total number of elements shown. It does not, however, give the number of metalloids compared to the total number of elements shown.

Answer Key and TAKS Doctor for Mini-Tests

Section 1

Answers	TEKS Correlation	TAKS Objectives
1 B	R 8.9B	1
2 G	R 8.10K	
3 B	R 8.10F	1
4 J	R 8.10H	4

TAKS Doctor

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 use the information in the passage to determine the probable distribution of 3 electrons in an atom.*

F **Incorrect.** As stated in the second sentence, the first energy level can hold only 2 electrons.

G **Correct.** The first paragraph states that electrons fill each energy level only after the previous level has been filled. It also states that the first level will hold 2 electrons. So, in the atom described, there would be 2 electrons in the first level and 1 in the second level.

H **Incorrect.** The first paragraph states that electrons fill each energy level only after the previous level has been filled, and 3 electrons would not be enough to fill the first 2 levels completely.

J **Incorrect.** The first paragraph states that electrons fill each energy level only after the previous level has been filled, and 3 electrons would not be enough to fill the first 3 levels completely.

Item 4 *asks students to infer the reason that the electrons in an atom's outer energy level have a special name.*

F **Incorrect.** As stated in the second sentence, the first energy level is the one closest to the nucleus.

G **Incorrect.** The passage does state that the third energy level can hold 18 electrons, but valence electrons are not always in the third energy level.

H **Incorrect.** All electrons are negatively charged, but this does not explain why electrons in the outermost energy level would have a special name.

J **Correct.** These electrons are important, and therefore have a special name, because they are a key factor in the way that a substance reacts with other substances, as stated in the last sentence.

Answer Key and TAKS Doctor for Mini-Tests

Section 2

Answers	TEKS Correlation	TAKS Objectives
1 C	R 8.10H	4
2 F	R 8.10F	1
3 B	R 8.10K	
4 J	R 8.10H	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 3 *asks students to use the information in the passage to decide which element would be most reactive.*

A **Incorrect.** According to the last sentence, elements that have only one or two electrons to gain, lose, or share are the most reactive. Therefore, an element that needs to lose three electrons would not be as reactive as an element that needs to lose one electron, as in choice B.

B **Correct.** According to the last sentence, elements that have only one or two electrons to gain, lose, or share are the most reactive. Therefore, this choice is the most reactive of all the answer choices.

C **Incorrect.** As stated in the fourth sentence, atoms that have full outer energy levels do not react easily.

D **Incorrect.** According to the last sentence, elements that have only one or two electrons to gain, lose, or share are the most reactive. Therefore, an element that needs to gain four electrons would not be as reactive as an element that needs to lose one electron, as in choice B.

Item 4 *asks students what they can infer about atoms that have reacted with other atoms.*

F **Incorrect.** Group 1 is a category of elements, not compounds.

G **Incorrect.** The passage states that valence electrons are part of an atom's outer energy level. "Valence electrons" is not a name for atoms which have reacted with other atoms.

H **Incorrect.** The last paragraph states that very reactive atoms are those that need to gain, lose, or share only one or two electrons. It also implies that such atoms form compounds by gaining, losing, or sharing their electrons with other atoms. Such a transfer or bond would change the electron configuration for both atoms. Because the atoms were unstable due to their previous electron configuration, a change in that configuration would be likely to make them more stable.

J **Correct.** Very reactive elements combine to form compounds in order to have filled outer levels. Once an outer level is filled, the atom is stable; this is implied in the fourth sentence of the first paragraph.