Name _____

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THE PERIODIC TABLE from the *Elements of Chemistry Series*
Pre-Test

Directions: This will help you discover what you know about the periodic table before you begin this lesson. Answer the following True or False.

1. All of the elements of the periodic table were known by 1910.
   T_____ F_____

2. Modern periodic tables list the elements by their atomic numbers.
   T_____ F_____

3. The position of the element on the periodic table explains the structure of the atom and helps explain how elements react with other elements.
   T_____ F_____

4. All transuranium elements have an atomic number beyond 90.
   T_____ F_____

5. The columns of the periodic table are called groups.
   T_____ F_____

6. The amu is a measure of the atomic number of elements.
   T_____ F_____

7. Electrons never move from atom to atom.
   T_____ F_____

8. Each atom attempts to interact with other atoms so that the electron configuration of its outer valence energy level is full.
   T_____ F_____

9. Chemists are mainly concerned with the valence electrons because they determine how atoms bond together.
   T_____ F_____

10. The p Block elements are very rare.
    T_____ F_____

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THE PERIODIC TABLE from the *Elements of Chemistry Series*
Vocabulary Definitions

The following words and terms used in the program may be unfamiliar to you. Try to listen for these terms while viewing the program, pay close attention so you can later include them in your scientific descriptions, observations, and creative writing assignment activities.

alkali metals - Group 1 elements. They are part of the s Block group of elements.

alkaline earth metals - Group 2 elements. They are part of the s Block group of elements.

atom - The fundamental unit of matter in the universe, made up of a nucleus of protons and neutrons and orbiting electrons.

atomic number - The number of an element is determined by the number of protons in its nucleus.

atomic mass - The mass of the element.

atomic mass unit (amu) - This is a measurement of the atomic mass. One amu is roughly equal to the mass of one proton.

electron - Negatively charged particles that orbit the nucleus of atoms.

electron configurations - The patterns of the movements of electrons.

electronegative elements - Those elements that tend to attract electrons. They are on the right-hand side of the periodic table.

electropositive elements - Those elements that tend to lose electrons. They are on the left-hand side of the periodic table.

element - An atom with a unique number of protons.

energy levels - Electrons orbit the nucleus of atoms with different levels of energy. These energy levels are sometimes called shells or levels. The energy levels correspond to the periods of the periodic table.

f Block elements - Elements placed below the main body of the periodic table.

groups - Vertical columns of the periodic table.

matter - Material that makes up objects. Matter cannot be created or destroyed.

mass - The total quantity of an object's matter.

Mendeleev, Demitri - Russian chemist, 1834 - 1907.

Moseley, Henry - British chemist, 1887 - 1915.

neutron - Particle in the nucleus of atoms that has no electrical charge.

noble gases - Elements on the right-hand side of the periodic table. The valence energy levels of noble gases are full of electrons and consequently these elements rarely combine with other elements.

nuclear stability - An atom that is electrically neutral has an equal number of protons and electrons.

nucleus - The center of an atom.

Octet Rule - Atoms tend to gain, lose or share electrons in order to acquire a full set of valence electrons

orbitals - The shapes of the orbits of electrons. There are four orbital shapes: s, p, d and f.

p Block elements - Elements at the right-hand side of the periodic table.

period - Horizontal rows of the periodic table.

Periodic Law - When elements are arranged in order of increasing atomic number, their physical and chemical properties show a periodic pattern.

periodic table - The arrangements of elements according to their atomic number.

principle quantum number - Often referred to as "n." This number refers to the energy of the orbitals and corresponds to the periods in the periodic table.

proton - Positively charged part of the nucleus of atoms.

quanta - Quantities of energy.

quantum numbers - Four numbers that describe the motion of electrons.

Quantum Theory - The theory that explains matter and energy at atomic and sub-atomic levels, sometimes called Quantum Mechanics.

Rutherford, Ernest - New Zealand, British physicist, 1871 - 1937.

second quantum number - Refers to the shape of the orbital.

squares of the periodic table - Every element has its own square on the periodic table where its properties are listed.

third quantum number - Refers to the orientation of the orbital.

transitional metals - d Block elements.

transuranium elements - There are 92 elements found naturally in the universe. Several elements with atomic numbers greater than 92 have been created under laboratory conditions, which are called transuranium elements.

valence electrons - The outer ring of electrons of an element.

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THE PERIODIC TABLE from the *Elements of Chemistry Series*
Use the Right Word

Directions: Find the right word from the vocabulary list that completes the following sentences.

1. Negatively charged particles that circle the nucleus of atoms are called _____.

2. The number of protons in the nucleus of atoms gives an element its _____ _____.

3. An atom with a unique number of protons is called an _____.

4. The horizontal rows of the periodic table are called _____.

5. The vertical columns of the periodic table are called _____.

6. The measure of the atomic mass of element is called the atomic mass _____ , or amu.

7. The shape of the orbits of electrons are called _____.

8. Elements with atomic numbers greater than 92 are called _____ elements.

9. Every element has its own _____ in the periodic table.

10. The outer energy level of electrons are called the _____ level.

Name _____

2c

THE PERIODIC TABLE from the *Elements of Chemistry Series*
Word Match

Directions: Connect the word with the proper definition.

amu	elements arranged by atomic number
element	shapes of the orbits of electrons
electron	positively charged particle
groups	outer ring of electrons
nucleus	atomic mass unit
orbitals	horizontal rows of the periodic table
periodic table	center of the atom
periods	an atom with a unique number of protons
proton	vertical columns of the periodic table
valence electrons	negatively charged particle

Name _____

3

THE PERIODIC TABLE from the *Elements of Chemistry Series*
Connected/Not Connected

Directions: Place the following words in the proper sentences.

alkali	**electrons**	**hydrogen**	**protons**
alkaline	**electropositive**	**nuclear**	**radius**
amu	**elements**	**number**	**squares**
configurations	**f Block**	**p Block**	**uranium**
electronegative	**groups**	**periods**	**valence**

1. The _____ of an element are connected to the _____ because one is positively charged and the other is negatively charged. That electrical charge holds the atom together

2. The atomic _____ is NOT connected to _____ because one is a measure of the number of protons in the nucleus of an element and the other is a measure of the element's atomic mass.

3. The _____ of the periodic table are connected to the _____ of the periodic table because one is the name of the horizontal rows and the other is the name of the vertical columns.

4. _____ elements are NOT connected to _____ elements because one group of elements tend to attract electrons and the other tends to lose electrons.

5. Electron _____ are connected to _____ electrons because it is the outer ring of electrons that are important in determining the chemical properties of elements.

6. _____ metals are NOT connected to _____ earth metals because one is a group 1 set of elements and the other is a group 2 set of elements.

7. _____ are connected to _____ because each atom with a unique number of protons has its own location on the periodic table.

8. _____ elements are NOT connected to _____ elements because one group is on the right-hand side of the periodic table and the other is placed below the main body of the periodic table.

9. The _____ of atoms is connected to _____ because the more protons in the nucleus of the atom the greater the electrical charge of the nucleus and the tighter the electrons are held.

10. _____ is NOT connected to _____ because one is the simplest element found naturally in the universe and the other is the most complex.

Name _____

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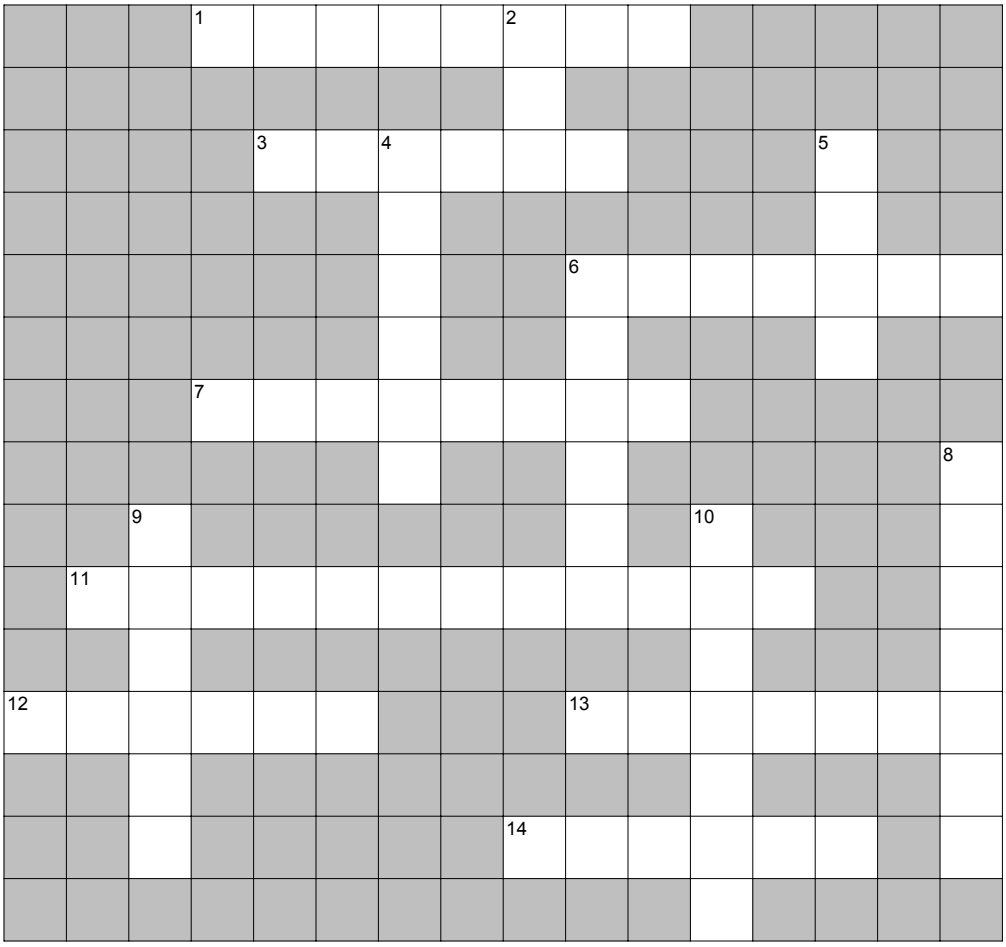
THE PERIODIC TABLE from the *Elements of Chemistry Series* Crossword Puzzle



Across

1. Shapes of the orbits of electrons.
3. Distance from the nucleus to the outer electron.
6. Horizontal row of elements in the periodic table.
7. Negatively charged particle.
11. Elements above atomic number 92.
12. Each element has a ___ in the periodic table.
13. ___ electrons are the outer ring of electrons.
14. Alkali metals.

Down

2. Atomic mass unit.
4. Transitional metals.
5. Fundamental unit of matter.
6. Positively charged particle.
8. Atom with a unique number of protons.
9. Vertical column of elements in the periodic table.
10. Center the atom.

Name _____

5

THE PERIODIC TABLE from the *Elements of Chemistry Series*
Creative Writing Story Ideas

Directions: Choose from one of the ideas listed below and write a story or dramatization. Include plot lines that follow scientific principles and key vocabulary terms.

1. A group of scientists in the future believes that element 126 has been found on a planet orbiting a near star. An expedition has been sent to collect a sample of this element. Describe what happens when they arrive.

2. A student working in an archive in Rome comes across a medieval manuscript that describes the work of an alchemist who developed a secret formula to turn lead into gold. A secret criminal society has learned about the discovery and wants the formula so they can make a fortune. The world government also wants to get the formula because they fear that if huge quantities of gold flood the market, it will ruin the monetary system of the world. What happens?

3. The chemist living next door has discovered a new hair replacement formula and hires you to market it. Everything goes wrong, including the formula. Write a humorous story using this plot line.

4. A chemistry researcher just out of graduate school has been hired to teach in a high school. In trying to explain the periodic table the teacher is drawn into a discussion about fundamental questions of matter, life, and spirit. Write a dialogue of this classroom discussion.

5. Research the work of Ernest Rutherford and Henry Moseley. Write a short story that describes their discoveries about the atom and how they came to understand that the structure of the atom relates to the periodic table.

Name _____

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THE PERIODIC TABLE from the *Elements of Chemistry Series* Video Quiz

Directions: Answer the following either true or false, or fill in the blank with the correct word to make it true.

1. The periodic table remains a major analytical tool of modern chemistry.
   T_____ F_____

2. An element is determined by the number of _____ in its nucleus.

3. The atomic mass of all elements is the same.
   T_____ F_____

4. The Periodic Law states: "When elements are arranged in order of increasing atomic number their physical and chemical properties show a periodic pattern."
   T_____ F_____

5. Transuranium elements are found in small quantities in remote planets.
   T_____ F_____

6. The horizontal rows of the periodic table are called _____.

7. The vertical columns of the periodic table are called _____.

8. Electron configurations determine the chemical properties of elements.
   T_____ F_____

9. The electrons in the outermost energy level are called the _____ electrons.

10. The p Block elements on the right hand side of the periodic table are eight elements wide.
    T_____ F_____

Name _____

7

THE PERIODIC TABLE from the *Elements of Chemistry Series*
Post-Test

Directions: Fill in the blank with the appropriate term from the list below.

amu	element	orbital	squares
atom	groups	periods	transuranium
chemistry	matter	proton	uranium
electron	nucleus	radius	valence

1. An atom with a specific number of protons is called an _____.

2. Elements with an atomic number greater than 92 are called _____ elements.

3. The vertical columns of the periodic table are called _____.

4. The horizontal rows of the periodic table are called _____.

.....

True or False
Directions: Fill in the blank with True or False. If the statement is false, change it to make the statement true. Rewrite the true statement in the space provided.

5. _____ The Russian scientist, Demitri Mendeleev, developed a periodic table using atomic number.

6. _____ The position of an element in the period of the periodic table is the only thing that is important to know about it.

7. _____ The size or radius of atoms is an important factor in their bonding.

8. _____ All elements beyond the number 82 are called transuranium elements.

9. _____ Valence electrons have the same importance as all electrons.

.....

Essay Section
Directions: Answer the following questions in complete sentences. Use the back of this page or a separate sheet of paper if you need more space to complete your answer.

10. Why is the periodic table such a useful tool for chemists?

11. Why is the information in the square of each element important?

12. How do the blocks of elements on the periodic table relate to the atomic structure of elements?

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