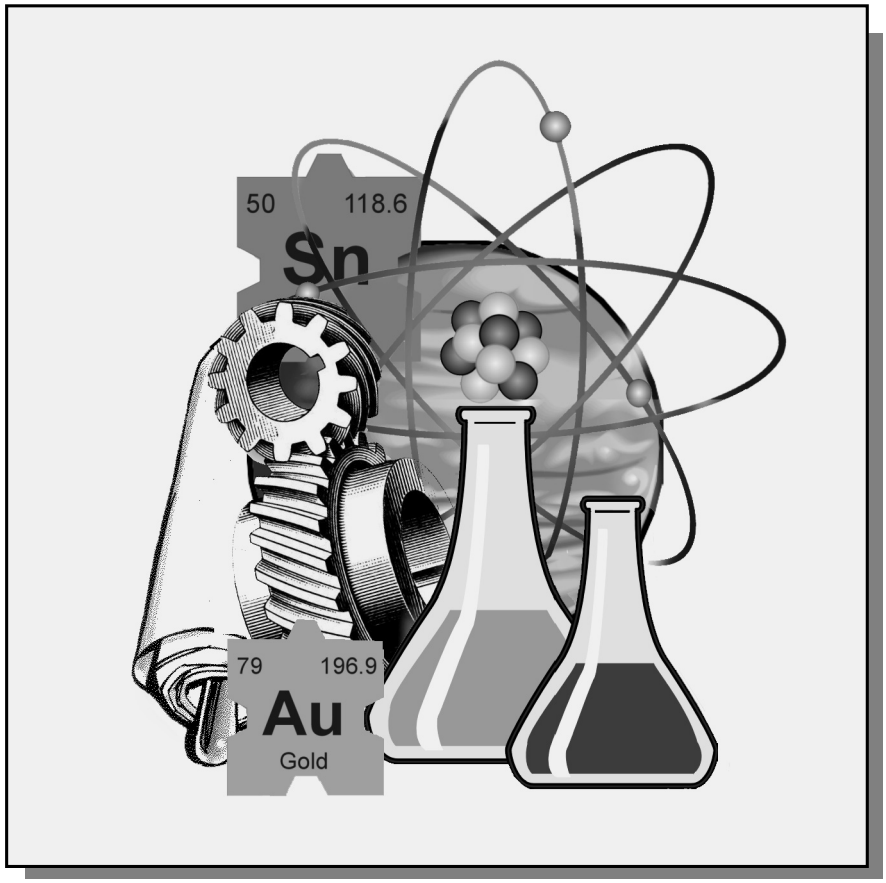
Integrated Physics & Chemistry

ACTIVITIES



Chapter 7

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Integrated Physics & Chemistry

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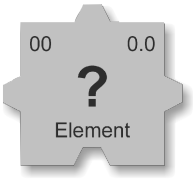
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Exploring the Periodic Table



You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

*1. Mendeleev arranged the elements based upon their: _____.
(a) ***valence***, ***atomic weight***, taste and smell (c) boiling and melting temperatures
(b) color and density (d) ***valence*** and ***atomic weight***

2. To silence his critics, Mendeleev: _____.
(a) confronted them in public
(b) used the Law of Gravity
(c) predicted the existence of missing elements and described their properties
(d) put aside his periodic table until he retired

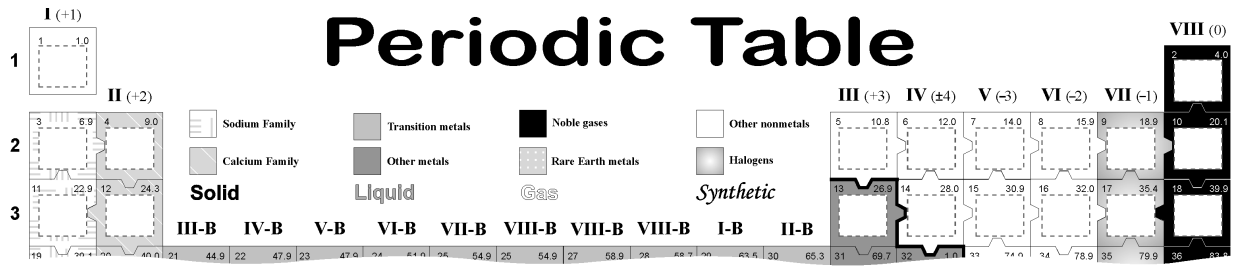
3. Gallium is noted for its ability to change directly from a solid to a gas when heated.
(a) True or (b) False

4. *Germanium* is best described as a(n): _____.
(a) conductor (b) ***metal*** (c) anti-conductor (d) ***semiconductor***

5. The element mendelevium is named after: _____.
(a) a medieval chemist (c) the men who discovered radioactivity
(b) Dmitri Mendeleev (d) the country where it was discovered

*6-23. Using the Periodic Table of the Elements shown in your lesson, arrange the symbols of the following elements to complete the first three periods of the periodic table below:

6. argon (Ar)
7. beryllium (Be)
8. boron (B)
9. carbon (C)
10. chlorine (Cl)
11. fluorine (F)
12. helium (He)
13. hydrogen (H)
14. lithium (Li)
15. magnesium (Mg)
16. neon (Ne)
17. nitrogen (N)
18. oxygen (O)
19. phosphorus (P)
20. silicon (Si)
21. sodium (Na)
22. sulfur (S)
23. aluminum (Al)



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*24. A ***period*** is a _____ of the periodic table.

25. Lithium, beryllium, boron, carbon, nitrogen, oxygen, fluorine and neon make a _____ on the periodic table.

26. Neon is an example of a(n): _____.
(a) alkaline earth (b) ***inert*** gas (c) metal (d) ***nonmetal***

*27. Elements on the left side of the periodic table are _____.

28. The periodic table is given that name because the elements repeat their chemical properties at regular intervals or periods.
(a) True or (b) False

*29. The first period on the periodic table of elements has _____ elements.
(a) 2 (b) 21 (c) 18 (d) 32

30. Two rows are at the bottom of the periodic table because they: _____ _____.
(a) are made of elements so rare they can be ignored
(b) have chemical properties that do not show periodic changes
(c) have not been found yet
(d) fit on a page better that way

*31. A ***family*** is a _____ _____ of the periodic table.

32. Lithium, sodium, potassium, rubidium, cesium and francium make a _____.

*33. The elements of the sodium family have a valence of: _____.
(a) +1 (b) +2 (c) 0 (d) -1

*34. The chemical changes going down a family is _____ dramatic than the chemical changes going across a period.

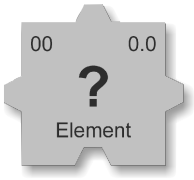
*35. The elements of the *calcium family* have a valence of: _____.
(a) –1 (b) +1 (c) +2 (d) 0

*36. The elements of the *chlorine family* have a valence of: _____.
(a) +1 (b) 0 (c) +2 (d) –1

*37. The elements of the ***inert gas family*** are usually given a valence of: _____.
(a) +1 (b) +2 (c) –1 (d) 0

38. Write the **Life Principle:** *"*_____ _____.*"*

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Element's Fingerprints



You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. At the age of eleven, Joseph von Fraunhofer labored _____ hours a day.

2. As the result of the collapse of the building in which Joseph von Fraunhofer's family was living, Joseph was severely injured.
   (a) True or (b) False

3. One of the reasons Von Fraunhofer was offered a job at the optical factory was because of his vast knowledge of astronomy and optics.
   (a) True or (b) False

4. Von Fraunhofer had no difficulty selling the _____ and other optical instruments he made.

5. When Von Fraunhofer tested a prism attached to a telescope in 1814, he noticed: _____ _____.
   (a) dark lines that crossed the Sun's spectrum
   (b) great flames on the surface of the Sun
   (c) helium bubbles in the Sun's atmosphere
   (d) a lunar eclipse

6. Joseph von Fraunhofer lived long enough to see his discovery of lines in the ***spectrum*** accepted as an important tool of science.
   (a) True or (b) False

*7. In the 1850s, Robert Bunsen taught chemistry at Heidelberg University and invented the _____.

*8. One advantage of the ***Bunsen burner*** was that it: _____.
   (a) was easy to remember
   (b) burned crude oil
   (c) had a complex design that chemists appreciated
   (d) produced a hot, steady flame

*9. The Bunsen burner could be used for the _____ because it introduced no false color.

*10. Lines in the spectrum can be bright or dark, depending upon the temperature of the background.
   (a) True or (b) False

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11. Elements of the same chemical family have an identical series of lines.
(a) True or (b) False

*12. *Cesium* and *rubidium* were discovered by: _____.
(a) their radioactivity (c) use of the spectroscope
(b) the Bunsen burner (d) electrolysis

13. Cesium and rubidium received their names based on: _____.
(a) color of their lines in the spectroscope (c) placement in the periodic table
(b) the countries in which they were found (d) their density

*14. A prism separates light into the colors by _____.

*15. ***Dispersion*** is based on: _____.
(a) constructive and destructive interference of light
(b) differences in the index of refraction for different colors of light
(c) principle alone
(d) speed of the light

*16. A diffraction grating is a surface that produces a rainbow effect.
(a) True or (b) False

*17. A *diffraction grating* produces colors of the rainbow by: _____.
(a) absorbing the light (c) *constructive* and *destructive* ***interference*** of light
(b) ***dispersion*** of light (d) reflection of light

*18. Butterfly wings, fish scales, feathers of some birds, and other surfaces with fine scratches are examples of _____ in nature.

*19. Modern ***spectroscopes*** spread light into the colors with _____ rather than prisms.

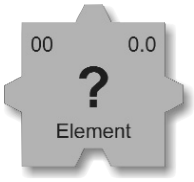
20. Write the **Life Principle:** *"*_____
_____.*"*

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Chapter 7, Section 1

Date: _____ Grade: _____



The Noble Gases—Argon

ACTIVITIES
Lesson 3:
Elements

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

*1. ***Argon*** is used in incandescent light bulbs because argon: _____.
(a) glows a bright white
(b) reacts with carbon to make a tough coating
(c) slows the vaporization of hot tungsten
(d) is colorless

*2. The first commercial use of *noble gases* was: _____.
(a) oxygen in welding (c) helium in dirigible ships
(b) argon in light bulbs (d) neon in lighted signs

3. Mendeleev predicted the existence of the noble gases.
(a) True or (b) False

*4. Cavendish caused nitrogen and oxygen to combine with one another by: _____
_____.
(a) chilling them to absolute zero
(b) inhaling large quantities of them
(c) heating them in the presence of nickel
(d) sending an electric spark through the air

5. Cavendish's experiment made him wonder if another gas in the atmosphere might be even more inert than _____.

6. One of the ways Lord Rayleigh prepared nitrogen was by releasing it from nitrogen compounds.
(a) True or (b) False

*7. The prefix 'di' in ***diatomic*** means: _____.
(a) heavy (b) two (c) colorless (d) one

8. The formula for *ozone* is _____.

*9. The nitrogen sample from the air was denser than expected because it was not
_____.

10. William Ramsay found that the mystery gas in the atmosphere was _____ reactive than nitrogen.

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*11. The final test that proved the atmosphere contained a new element was viewing the spectrum of the gas with a _____.

12. The name *argon* means: _____.
(a) clumsy (b) golden (c) inert (d) Argo

*13. The first noble gas discovered was: _____.
(a) nitron (b) helium (c) argon (d) neon

*14. The most common noble gas on Earth is: _____.
(a) argon (b) nitron (c) helium (d) neon

*15. Argon is extracted in large amounts from: _____.
(a) the atmosphere (b) seawater (c) uranium (d) kryptonite

*16. The prefix 'mon' in the word ***monatomic*** means _____.

*17. The noble gas that William Ramsay identified that had been found first in the Sun was: _____.
(a) argon (b) helium (c) krypton (d) radon

*18. _____ gases are given that name because they are inert and aloof.

19. Nitrogen is a member of the noble gas family.
(a) True or (b) False

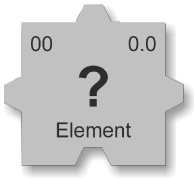
20. Write the **Life Principle:** *"*_____
_____*."*

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ACTIVITIES
Lesson 4:
Elements

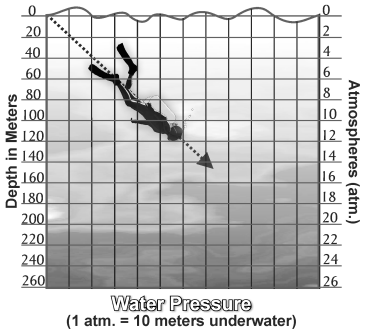
The Noble Gas Family

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

*1. The symbol for ***helium*** is _____.

*2. Helium is used in place of hydrogen to fill balloons because helium is: _____
_____.

(a) lighter and gives greater lift (c) offers less resistance to the wind
(b) not explosive (d) cheaper



3. According to the chart to the right, at what depth would the pressure on the diver be equal to twenty-four atmospheres?
_____

4. To what painful condition would be subject in resurfacing from that depth? _____
(a) sharks (b) bends (c) cramps (d) dermatitus

*5. The bends are caused by bubbles of _____ in the blood.

*6. Helium mixed with oxygen helps prevent the bends because helium: _____
_____.

(a) is lighter than nitrogen
(b) does not dissolve under pressure as readily as nitrogen
(c) resolves under pressure
(d) remains a solid until it is needed for breathing

*7. A high-speed sled achieves greater speed while going through a tent filled with helium because helium: _____.

(a) burns with a hotter flame (c) does not burn at all
(b) will not explode (d) offers less resistance than the atmosphere

8. Helium at room temperature is a: _____.
(a) gas (b) liquid (c) vapor (d) solid

9. Helium can be made a _____ by chilling it to –267.9ºC.

10. Helium for commercial uses is extracted from: _____.
(a) the atmosphere (b) natural gas (c) butane (d) nitride

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11. ***Krypton*** was discovered by: _____.
(a) using *subatomic particle accelerators* (c) heating a gas from an oil well
(b) ***fractional distillation*** of air (d) releasing it from kryptonite

*12. The symbol for krypton is _____.

*13. The advantage of the orange-red light from krypton strobe lights is that: _____
_____.
(a) it is only visible with special glasses
(b) it is brighter than other lights
(c) it penetrates haze and fog
(d) krypton for the lights is more abundant than other inert gases

*14. If the amount of krypton in the atmosphere increased suddenly this could be a clue that:
_____.
(a) a meteor is about to impact the Earth
(b) the Sun is going to explode
(c) someone is attacking Superman
(d) some country is secretly building nuclear weapons

15. ***Neon*** is from a Greek word meaning: _____.
(a) blue (b) hidden (c) new (d) inert

*16. The symbol for neon is _____.

*17. One use of neon is: _____.
(a) to make things new (c) in glowing advertising signs
(b) in blimps (d) to mix with mercury to make dental fillings

*18. The symbol for *xenon* is _____.

*19. The symbol for *radon* is _____.

*20. The radioactive noble gas is: _____.
(a) argon (b) radon (c) krypton (d) neon

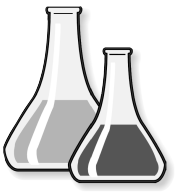
21. The discovery of the noble family of gases destroyed the periodic table.
(a) True or (b) False

22. Write the **Life Principle:** *"*_____
_____
_____.*"*

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Name: _____

Date: _____ Grade: _____



ACTIVITIES
Lesson 5:
Compounds

Chemical Bonds

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

*1. Neil Bartlett made a compound that contained _____, a noble gas element.

2. Nitrogen does not form compounds.
(a) True or (b) False

3. Argon is _____ active than nitrogen.

*4. The _____ noble gases are more likely to form compounds.

5. Neil Bartlett chose **NOT** to experiment with radon because it is: _____.
(a) inert (b) heavier than xenon (c) radioactive (d) lighter than radon

*6. _____ is the most chemically active element known.

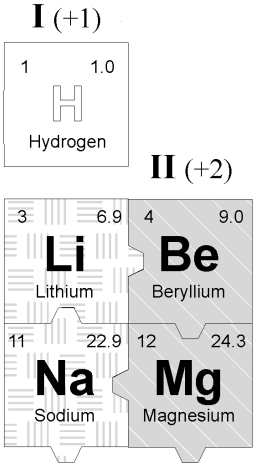
7. Neil Bartlett used a container of nickel because nickel is a _____.

8. Compounds have been made of both xenon and: _____.
(a) argon (b) neon (c) helium (d) krypton

*9. A chemical compound forms because atoms release, accept or _____ electrons.

*10. The shell that contains the electrons that take part in chemical reactions is the outermost shell, also known as the _____ shell.

11. You can tell by looking at the periodic table segment to the right that Lithium has a valance of: _____.
(a) 3 (b) +2 (c) +1 (d) 6.9



*12-27. Write the *valence* below each element in this table:

H							He
1							0
Li	Be	B	C	N	O	F	Ne
__	__	__	__	__	__	__	__
Na	Mg	Al	Si	P	S	Cl	Ar
__	__	__	__	__	__	__	__

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*28. Sodium is likely to _____ during chemical reactions.
(a) accept an electron (c) explode
(b) release an electron (d) evaporate

*29. Chlorine is likely to _____ during chemical reactions.
(a) accept an electron (c) have no reaction
(b) release an electron (d) implode

*30. In sodium chloride, the negative ion is _____.

*31. Atoms in ***ionic compounds*** are held together by _____ static charges.

*32. An example of a ***covalent compound*** is _____.

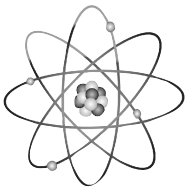
*33. Atoms in _____ compounds are held together by the need to share electrons.

34. Write the **Life Principle:** *"*_____
_____
_____.*"*

Note: Ask your teacher for the quiz over topics 1-5 before proceeding to the next section. Reminder: If you score 85% or higher on the three section quizzes, you may be exempt from the chapter test!



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ACTIVITIES
Lesson 6:
Energy

Inside the Atom–The Electron

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Michael Faraday succeeded in sending ***electrons*** across a vacuum.
   (a) True or (b) False

2. William Crookes learned how to use the spectroscope from William Ramsay.
   (a) True or (b) False

3. William Crookes was the first to make a perfect vacuum in which all air molecules had been removed.
   (a) True or (b) False

4. Each vane of the paddlewheel in the Crookes radiometer was painted white on one side and _____ on the other side.
   (a) purple (b) black (c) bright red (d) dark green

5. The paddlewheel of the *radiometer* began to spin when the vanes were struck by: _____.
   (a) chilled air molecules (c) heated air molecules
   (b) inertia (d) lightning

6. A _____ is so sensitive it can measure the heating effect of faint starlight.

*7. _____ rays come from the negative terminal of a battery.

*8. The invention found in heart monitors, televisions, oscilloscopes and computer screens is the: _____.
   (a) Bunsen burner (c) spectroscope
   (b) ***cathode ray tube*** (d) *radiometer*

*9. ***Cathode rays*** are streams of _____.

*10. Because cathode rays struck the wheel and caused it to roll along a track, J. J. Thomson concluded that cathode rays were _____ _____.

*11. Because cathode rays were repelled by a plate with a negative charge, J. J. Thomson concluded that cathode rays had a _____ charge.
   (a) positive (b) negative (c) no (d) directional

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12. Because the charged metal plate caused all cathode rays to change direction by the same amount, J. J. Thomson concluded that cathode rays have: _____ _____.
    (a) different charges (c) exactly the same negative charge
    (b) a positive charge (d) no charge

13. J. J. Thomson assumed the electron had a charge equal to that of a hydrogen ion (H^+) but opposite in sign.
    (a) True or (b) False

*14. Based on his assumption about the charge of an electron, J. J. Thomson calculated the electron's mass as: _____.
    (a) 1/1837 the mass of a hydrogen ion (c) equal to that of a proton
    (b) larger than a proton (d) far too small to measure

15. Robert Millikan succeeded in measuring the mass of a single electron.
    (a) True or (b) False

*16. Robert Millikan's experiment with a single electron is known as the Millikan _____ - _____ experiment.

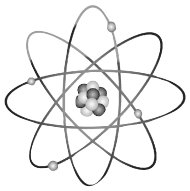
*17. The electron is far _____ than an atom.

*18. The symbol for an electron is: _____.
    (a) e^- (b) H^+ (c) H^- (d) p^+

*19. An electron carries a unit _____ charge.

20. Write the **Life Principle:** *"*_____ _____.*"*

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ACTIVITIES
Lesson 7:
Energy

Inside the Atom

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. The *plum pudding model of the atom* placed the electrons mixed in with the positive matter.
   (a) True or (b) False

*2. Probing inside an atom requires _____ particles.

*3. Light cannot be used to look inside atoms because: _____.
   (a) it is already too light
   (b) it does not have enough energy
   (c) it is too small
   (d) its waves are too large

*4. The electric charge of an ***alpha particle*** is: _____.
   (a) the same as that of an electron
   (b) the same as a proton
   (c) 8,000 times greater than the charge of an electron
   (d) twice that of an electron, but of the opposite sign

*5. An alpha particle weighs about the same as: _____.
   (a) a helium atom (b) a ***neutron*** (c) two electrons (d) one electron

6. Rutherford used gold as the target for his alpha particles because: _____
   _____.
   (a) he wanted a quality metal
   (b) Canada had a huge gold reserve
   (c) gold can be hammered into very thin sheets
   (d) gold is transparent

*7. Alpha particles would cut deeply into a sample of gold foil, because they have:
   _____.
   (a) a high speed and mass
   (b) no electric charge
   (c) a low speed and mass
   (d) sharp edges

8. When Rutherford shot the alpha particles at the gold foil, he expected them to:
   _____.
   (a) be absorbed by the gold nucleus
   (b) go straight through
   (c) be scattered in all directions
   (d) bounce back

9. Most alpha particles went through the _____ as if it were mostly empty space.

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10. The results of Rutherford's alpha scattering experiment confirmed J. J. Thomson's plum pudding model of the atom.
(a) True or (b) False

*11. Most of the mass and all of the positive charge of an atom is concentrated in the _____.

12. When an alpha particle hit an electron, the alpha particle: _____.
(a) bounced back (c) veered off course
(b) began circling the electron (d) crashed through and kept right on going

13. An alpha particle and a gold ***nucleus*** both have a(n) _____ charge.
(a) positive (b) negative (c) neutral (d) electric

14. An alpha particle is _____ by the electric charge of the nucleus of the gold atom.

*15. The ***planetary model of the atom*** pictures the nucleus as the Sun and the _____ as the planets.

16. Ernest Rutherford suggested that the smallest positive particle would be the _____ atom with its electron removed.

17. The symbol for a ***proton*** is: _____.
(a) e^+ (b) e- (c) H (d) p^+

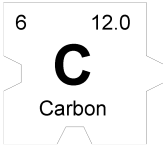
*18. Protons and _____ are found in the nucleus of an atom.

*19. A carbon atom has six protons. How many electrons must it have to be electrically neutral? _____

20. A neutral atom does not have: _____.
(a) energy (b) valence (c) an electrical charge (d) mass

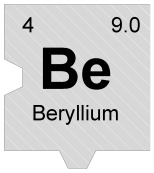
21. Using the information for each element shown on the right, answer the following questions.
What is the atomic mass of carbon? _____

What is carbon's atomic number? _____



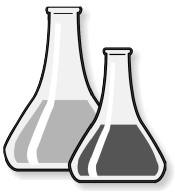
How many electrons does beryllium have? _____

How many protons does beryllium have? _____



22. Write the **Life Principle:** "_____ _____."

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ACTIVITIES
Lesson 8:
Compounds

Chemical Bonding

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

*1. ***Teflon*** is a compound containing: _____.
(a) plastic (b) alpha particles (c) chlorine (d) fluorine

2. Dr. Plunkett knew the *fluorine* compound had not escaped from the storage tank because: _____.
(a) fluorine atoms are too large to go through the valve
(b) he could still smell it
(c) fluorine is a solid
(d) the tank had not lost any weight

*3. Teflon is slippery, resists electrical currents and is chemically _____.

*4. Teflon is used to coat surgical implants because: _____.
(a) it generates vitamins that go throughout the body
(b) the human body tolerates it
(c) it is smooth on both sides
(d) it does not interfere with electrical signals

5. One problem with Teflon is that it melts at room temperature.
(a) True or (b) False

*6. As a general rule, the more active an element is the _____ active are its compounds.

*7. Fluorine is a member of the _____ family.

*8. When fluorine reacts with metals it forms _____ bonds.
(a) *covalent* (b) ionic (c) subatomic (d) relational

*9. The fluorine gas molecule (F_2) is an example of a(n) _____ bond.
(a) elemental (b) covalent (c) ***ionic*** (d) subtonic

*10. When using dots to represent electrons, each dot represents: _____.
(a) one electron (b) two bonds (c) two electrons (d) three electrons

11. The number of electrons in the outer or valence shell of an electrically neutral fluorine atom is _____.

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12. By sharing electrons, each atom of fluorine gas (F_2) has _____ electrons in the outer shell.

*13. Methane is formed by _____ bonds.

*14. In methane, each hydrogen atom has _____ electrons in its outer shell.

*15. In methane, each carbon atom has _____ electrons in its outer shell.

*16. When showing chemical bonds by dashes, each dash represents _____ electrons.
(a) one (b) two (c) five (d) three

*17. Freon and Teflon are examples of: _____.
(a) ***fluorocarbons*** (c) bicarbons
(b) ***hydrocarbons*** (d) tetracarbons

*18. In diagrams showing covalent bonds, a single dash, —, represents two _____ and a double dash, =, represents four _____.

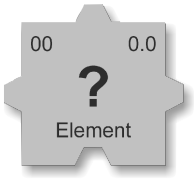
*19. Because Teflon is made of a long chain of repeated, identical units, it is know as a(n): _____.
(a) enlongation (b) domino compound (c) hexagon (d) ***polymer***

20. Write the **Life Principle:** *"*_____
_____.*"*

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Name: _____

Date: _____ Grade: _____



Fluorine, Chlorine and Bromine

ACTIVITIES
Lesson 9:
Elements

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

*1. ***Fluorescent*** minerals glow when struck by: _____.
(a) water (b) a hammer (c) ultraviolet light (d) infrared light

2. Fluorite is an example of a: _____.
(a) chlorine based sedative (c) dense liquid
(b) detergent (d) fluorescent mineral

*3. A cooler temperature reduces the activity of fluorine.
(a) True or (b) False

*4. The acid used to ***etch*** glass is _____ acid.
(a) ***hydrochloric*** (b) hydrofluoric (c) muriatic (d) sulfuric

5. _____ prevents tooth decay.
(a) Chlorine (b) Fluorine (c) Sulfide (d) Hydrocarbon

*6. Breathing chlorine gas is very soothing.
(a) True or (b) False

*7. _____ is added to drinking water to kill bacteria.
(a) Hydrocarbon (b) Chlorine (c) Fluorine (d) Sulfide

8. How many atoms of oxygen are in a single molecule of $Ca(OCl)_2$? _____

*9. An ***oxidizing agent*** mixed with swimming pool water kills bacteria and algae by removing the: _____.
(a) carbon (b) trash (c) oxygen (d) dead leaves

*10. The fluid used by dry cleaners is: _____.
(a) hydrochloric acid (c) dry fluid
(b) chloroform (d) carbon tetrachloride

11. The substance used in dry cleaning is called dry because it: _____.
(a) contains no water (c) sounds good
(b) is a powder (d) causes shrinkage

12. *Chloroform* was at one time used to _____ during surgical operations.

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*13. The method **NOT** used by factories to obtain chlorine is to: _____
_____.
(a) extract it from the atmosphere
(b) transport it as a pressurized liquid in railroad cars
(c) mix it with another element to make a nontoxic compound
(d) by electrolysis of sodium chloride

*14. The symbol for ***bromine*** is _____.

15. Bromine received its name from a Greek word meaning pleasant smell.
(a) True or (b) False

16. Bromine has chemical properties similar to those of: _____.
(a) sodium (b) chlorine (c) krypton (d) lead

17. Bromine is recovered from deep oil wells.
(a) True or (b) False

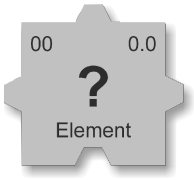
*18. _____ were often prescribed by doctors for patients who could not sleep.

*19. The chief use of _____ is in light-sensitive photographic film.

20. _____ _____ (AgBr) is highly sensitive to light.

21. Write the **Life Principle:** *"*_____
_____
_____.*"*

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Iodine, Astatine and Halogens

ACTIVITIES
Lesson 10:
Elements

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. ***Iodine*** crystals mixed with _____ kill harmful microorganisms.

2. Iodine was discovered accidentally from: _____.
   (a) a laboratory (c) a glowing mineral
   (b) a deep oil well (d) seaweed

3. Bernard Courtois made a fortune from extracting iodine.
   (a) True or (b) False

*4. The chemical symbol for *iodine* is _____.

*5. At room temperature, iodine is a: _____.
   (a) solid (b) vapor (c) liquid (d) gas

*6. _____ reacts more vigorously with water.
   (a) Fluorine (b) Iodine (c) Sodium (d) Chlorine

*7. _____ is dissolved in alcohol to make an ***antiseptic*** and ***disinfectant***.
   (a) Chlorine (b) Fluorine (c) Iodine (d) Astatine

*8. The thyroid gland enlarges if a person does not have enough _____ in the diet.
   (a) chlorine (b) astatine (c) iodine (d) fluorine

*9. Radioactive _____ can be used as a medical ***tracer*** to locate tumors in the body.

*10. _____ may help seed clouds to cause rain or prevent fog.
   (a) Silver iodide crystals (c) Gold crystals
   (b) Sodium iodide crystals (d) Iodized table salt

11. Mendeleev put iodine in the wrong place in the periodic chart.
   (a) True or (b) False

*12. The chemical symbol for astatine is _____.

13. ***Astatine*** received its name from a Greek word meaning _____.

14. Astatine is so inactive chemically it is often found free in nature.
   (a) True or (b) False

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*15. The elements fluorine, chlorine, bromine, iodine and astatine are know as ***halogens*** because they form: _____.
(a) acids (b) bases (c) liquids (d) salts

*16. $2Na + Cl_2 \rightarrow 2NaCl$ is a _____ equation.

17. The reaction $H_2 + F_2 \rightarrow 2HF$ forms hydrogen fluoride, also known as _____ acid.

*18. *HCl* is known as hydrochloric acid and hydrogen _____.

Match the following items:

*19. _____ fluorine
*20. _____ chlorine
*21. _____ bromine
*22. _____ iodine
*23. _____ astatine

(a) radioactive
(b) mixed with alcohol to make an antiseptic
(c) most reactive element known
(d) used as a poison gas during World War I
(e) used in photographic film

24. Write the **Life Principle:** *"*_____
_____
_____*."*

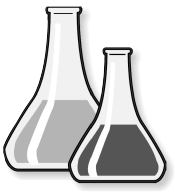
Note: Ask your teacher for the quiz over topics 6-10 before proceeding to the next section. Reminder: If you score 85% or higher on the three section quizzes, you may be exempt from the chapter test!



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Name: _____

Date: _____ Grade: _____



ACTIVITIES
Lesson 11:
Compounds

Acids, Bases and Salts

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

*1. ***Acids*** and ***bases*** are chemical _____.

*2. An acid has a _____ taste.
(a) surprising (b) sweet (c) bitter (d) sour

*3. An acid turns ***litmus paper*** _____.

*4. The element always found in acids is _____.

*5. The strength of an acid is measured by the number of hydrogen ions that it releases into a solution.
(a) True or (b) False

6. The stronger acid is a(n) _____ acid.
(a) sulfuric (b) nitric (c) acetic (d) hydrochloric

*7. The acid that gives lemons and grapefruit their sour taste is: _____.
(a) carbolic acid (b) citric acid (c) nitric acid (d) lactic acid

8. An acid that does not supply many hydrogen ions is described as: _____.
(a) concentrated (b) ***strong*** (c) ***weak*** (d) sour

9. An acid that has been mixed with a lot of water is described as: _____.
(a) soapy (b) *concentrated* (c) *dilute* (d) strong

10. Pure water is a(n): _____.
(a) base (b) ***neutral solution*** (c) acid (d) basic acid

11. An acid has a *pH*: _____.
(a) less than 7 (b) level (c) equal to 7 (d) greater than 7

*12. The chemical formula for *sulfuric acid* is _____.

*13. The chemical formula for *hydrochloric acid* is _____.

*14. The chemical formula for *nitric acid* is _____.

*15. A base has a _____ taste.
(a) sour (b) sweet (c) soapy (d) bitter

*16. Of acids and bases, the one that feels soapy is a _____.

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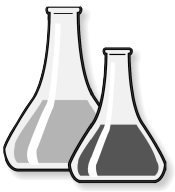
*17. A base turns litmus paper _____.

*18. _____ is a strong base.
(a) Ammonium hydroxide (c) Sodium chloride
(b) Sodium hydroxide (d) Lithium carbonate

*19. The reaction of an acid with a base produces water and a _____.

20. Write the **Life Principle:** *"*_____
_____.*"*

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ACTIVITIES
Lesson 12:
Compounds

Covalent Compounds and Water

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

*1. The animal that strives to maintain a constant body temperature is described as _____ blooded.
(a) blue (b) warm (c) cold (d) red

*2. Animals are aided in maintaining the correct body temperature by the unusual properties of: _____.
(a) water (b) ears (c) hydrocarbons (d) scales

*3. Water is a _____ compound.

4. Hydrogen and oxygen form water molecules by _____ electrons.
(a) exchanging (b) sharing (c) eating (d) destroying

5. Overall, the water molecule is electrically: _____.
(a) charged (b) neutral (c) abnormal (d) normal

*6. Because the water molecule has a positive region and a negative region it is described as being _____.

*7. Because it dissolves so many different substances, water is called the _____ solvent.

8. Labels on household cleaners may state, "Warning-do not mix with other products containing acids or ammonia." The safest solution with which to dilute the cleaner would be: _____.
(a) ammonia (b) acetic acid (c) water (d) vinegar

*9. Pure water is a _____ conductor of electricity.

*10. The most common liquid on Earth is: _____.
(a) coffee (b) petroleum (c) water (d) soda

11. Earth, Venus and Mars all have water in all three states.
(a) True or (b) False

12. The three states in which water can be found are solid, _____ and _____.

*13. The liquid with the highest ***specific heat*** is: _____.
(a) alcohol (b) antifreeze (c) mercury (d) water

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*14. Shivering is caused by muscles that: _____.
(a) have too much protein (c) are cramping
(b) are trying to rid the body of excess heat (d) are trying to generate heat

*15. To change from water at 100ºC to steam at 100ºC, each gram of water must _____ 540 calories of heat energy.
(a) absorb (b) release (c) destroy (d) store

*16. Evaporation is a _____ process.
(a) freezing (b) cooling (c) heating (d) warming

17. As the body sweats, the _____ changes to vapor and evaporates from the skin.

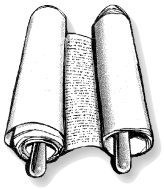
18. _____ has ***moderate*** temperatures, because of the action of water.
(a) The island of Puerto Rico (c) The Sahara Desert
(b) South America (d) Texas

*19. In changing from liquid water to ice, each gram of water _____ 80 calories of heat energy.
(a) absorbs (b) releases (c) stores (d) destroys

20. In cold weather, farmers spray water on groves in an effort to: _____.
(a) freeze the fruit (c) decrease insects
(b) keep the fruit from freezing (d) make ice sculptures

21. Write the **Life Principle:** *"*_____
_____
_____*."*

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ACTIVITIES
Lesson 13:
Scientific Laws

Ice

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

*1. When water changes to ice it: _____.
(a) evaporates (b) contracts (c) expands (d) dissolves

*2. Ice _____ in water.
(a) floats (b) splashes (c) dissolves (d) sinks

3. A _____ is a large mass of slowly moving ice.

4. Water is most dense at: _____.
(a) 0^0C (b) 100^0C (c) 32^0F (d) 4^0C

5. A bar of iron floats on top of molten iron.
(a) True or (b) False

*6. In winter, the warmest water is found _____ of a lake.
(a) at the top (c) in the middle
(b) on the bottom (d) near the shore

7. As water molecules change to snow, they join together to make: _____
_____.
(a) hail (c) a sphere one millimeter in diameter
(b) a compact pyramid structure (d) an open hexagon pattern

8. So intriguing is the purity of snowflakes, the Book of Job in the Bible measures virtue by the purity of snowflakes.
(a) True or (b) False

9. The one with a greater mass is a cubic centimeter of: _____.
(a) ice (b) fog (c) water (d) snow

10. Water molecules have a weak attraction for one another.
(a) True or (b) False

*11. At room temperature, water is a: _____.
(a) gas (b) liquid (c) vapor (d) solid

*12. At room temperature, methane is a: _____.
(a) gas (b) liquid (c) solid (d) soft drink

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13. _____ boils at a lower temperature than water.

*14. Most of the ice on the Earth is found in Greenland and: _____.
(a) Canada
(b) Glacier National Park in Montana
(c) the polar ***ice caps***
(d) Iceland's ***shipping lanes***

15. Water from ***glaciers*** is usually very polluted.
(a) True or (b) False

16. An iceberg floating in the North Atlantic Ocean had nothing to do with the sinking of the Titanic.
(a) True or (b) False

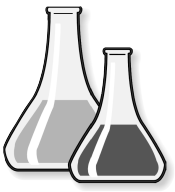
17. Glaciers are no longer in Glacier National Park in Montana.
(a) True or (b) False

18. Louis Agassiz believed that _____ found in valleys in Switzerland were carried there by glaciers.

19. Except for Switzerland and Montana, no other places on Earth have evidences of glacial grooves.
(a) True or (b) False

20. Write the **Life Principle:** *"*_____
_____*."*

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ACTIVITIES
Lesson 14:
Compounds

Solutions

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

*1. Blood is a ***solution*** and a solution is a _____.

*2. A _____ contains two or more elements that are found in exactly the same proportion.

*3. Muddy water is an example of a _____.

*4. Pure water is a compound, made of two atoms of hydrogen for every one atom of oxygen.
(a) True or (b) False

*5. Sugar dissolved in water is an example of a ***mixture*** that is also a solution.
(a) True or (b) False

6. A solution of water and a gas is **NOT** possible.
(a) True or (b) False

*7. One way to make a solid go into solution faster is to increase its _____ _____.

*8. Solids and liquids dissolve faster in _____ water.
(a) freezing (b) cold (c) hot (d) lukewarm

9. Sugar will dissolve faster in a cup of coffee if the coffee is: _____.
(a) allowed to sit (b) Starbucks (c) stirred (d) consumed quickly

*10. Water that has dissolved as much ***solute*** as possible is: _____.
(a) ***immiscible*** (b) ***saturated*** (c) dispersed (d) immersed

*11. The _____ of a substance is the number of grams of the substance that will dissolve in 100 grams of water at a given temperature.

12. Heating water increases the amount of sodium nitrate that will dissolve from 85 grams to 105 grams.
(a) True or (b) False

*13. Dissolving substances in water changes water's _____ or _____ temperatures.

*14. Gases dissolve better in _____ water.
(a) cold (b) hot (c) lukewarm (d) frozen

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*15. Doubling the pressure of a gas causes _____ as much to be dissolved.
(a) concern (b) twice (c) three times (d) one half

16. Water is the only liquid that can act as a ***solvent***.
(a) True or (b) False

17. Two examples of ***miscible*** liquids are oil and gasoline.
(a) True or (b) False

*18. Two liquids that mix easily are _____.

*19. Oil and water are _____ because they do not form a solution with one another.

20. Instructions found on a bottle of oil and vinegar salad dressing read: "shake well before using." The main reason for these instructions is: _____.
(a) solutions shaken together have fewer calories
(b) shaking allows for the necessary chemical changes to take place
(c) shaking temporarily mixes the oil and vinegar for use on foods
(d) shaking thoroughly changes the ingredients from immiscible to miscible

21. Write the **Life Principle:** *"*_____
_____*."*

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ACTIVITIES
Lesson 15:
Inventions & Discoveries

Cool, Clean Water

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Water that is too polluted to drink should be used for industrial purposes such as in boilers and radiators.
   (a) True or (b) False

2. Which of the following states would impact the water level of the Aquifer the most? _____ The least? _____
   (a) Colorado (b) Kansas (c) Oklahoma (d) Texas

3. The Ogallala ***Aquifer*** has been used for a hundred years and shows no signs that it is being exhausted.
   (a) True or (b) False

*4 Once an aquifer is polluted, _____ may take centuries.

5. A lake where water fails to circulate is likely to become a _____ water lake.

6. To change polluted water into pure water is to eliminate harmful chemicals and dangerous microorganisms.
   (a) True or (b) False

*7. The explorer eliminates mud and sand from water by: _____.
   (a) ***aeration*** (b) boiling (c) distilling (d) ***settling***

*8. Because it has a finer opening, a _____ filters out all but the smallest bacteria.
   (a) ***ceramic filter*** (b) charcoal filter (b) sponge (d) metal strainer

9. The explorer's water filter has a charcoal filter that is charged with an ion exchange _____.

*10. The purpose of an *ion exchange resin* is to replace _____ with less dangerous ions.
   (a) chlorine and iodine (c) subatomic particles
   (b) heavy metals (d) microorganisms

*11. Two ways to kill microorganisms in water are to use _____ and to boil the water.

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*12. Cities treat water by filtering it through: _____.
(a) bleached bones (c) gravel, coarse sand and fine sand
(b) fine chamois cloth (d) sponges

13. Once a municipal water filter becomes clogged it must be _____.

*14.The process of cleaning swimming pool filters is called _____.

*15. One purpose of spraying water into the air is to kill _____.

*16. _____ of the water kills most bacteria.

17. Settling and filtering removes unwanted material from both mixtures and solutions.
(a) True or (b) False

*18. Cities cannot use ion exchange resins to purify their water because they are too _____.

19. Pure water depends only upon the people who live along the banks of a river.
(a) True or (b) False

*20. In the laboratory, pure water is prepared by: _____.
(a) adding alcohol (c) freezing and thawing
(b) distillation and condensation (d) settling and filtering

21. Write the **Life Principle:** *"*_____
_____*."*

Note: Ask your teacher for the quiz over topics 11-15 before proceeding to the next section. Reminder: If you score 85% or higher on the three section quizzes, you may be exempt from the chapter test!



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