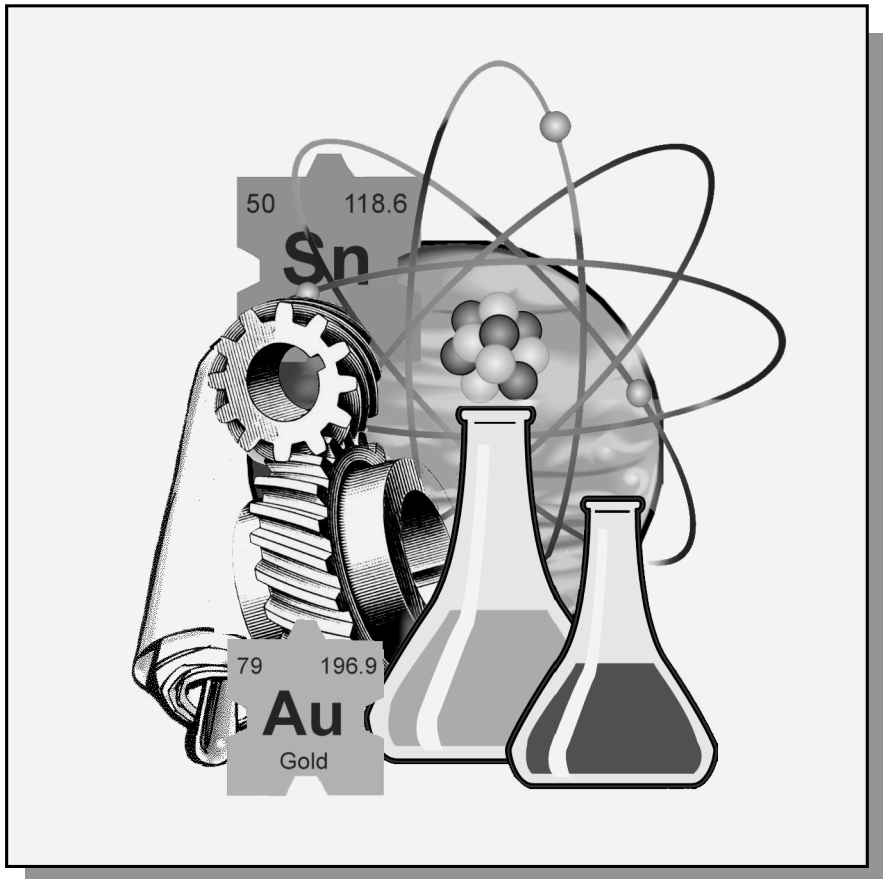
Integrated Physics & Chemistry

ACTIVITIES



Chapter 8

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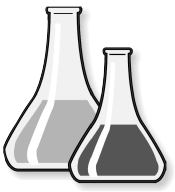
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ACTIVITIES
Lesson 1:
Compounds

Organic Chemistry

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. People often classify matter as animal, vegetable or _____.

2. Chemists of the 1800s gave the name _____ to compounds that came from vegetables and animals.

*3. Examples of ***inorganic*** compounds include: _____.
(a) coal and oil (c) starch and silk
(b) metals and salt (d) sugar and egg whites

*4. Examples of ***organic*** compounds include: _____.
(a) metals and rocks (c) minerals and acids
(b) acids and bases (d) sugar and egg whites

5. When tomatoes are grown with no artificial pesticides, insecticides, fertilizers or growth hormones, they are sometimes described as being: _____.
(a) inorganic (b) organic (c) extra large (d) abnormal

6. Organic and inorganic compounds are very similar in their chemical and physical properties.
(a) True or (b) False

*7. Between organic and inorganic compounds, the ones that have the fewer atoms are _____ compounds.
(a) inorganic (b) abnormal (c) organic (d) normal

*8. Between organic and inorganic compounds, the ones that can stand the higher temperature are _____ compounds.
(a) normal (b) inorganic (c) organic (d) abnormal

*9. ***Analysis*** of ***organic compounds*** shows that they contained carbon, hydrogen, oxygen and: _____.
(a) chlorine (b) helium (c) gold (d) nitrogen

*10. _____ is the separation of a compound into its elements.

*11. _____ is the formation of a compound by simpler compounds or elements.

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12. The one who stated that making an organic compound in the laboratory was impossible was: _____.
    (a) Adolph Kolbe (c) Franz Kohler
    (b) Friedrich Wohler (d) Jons Jakob Berzelius

13. The one who made urea by ***partial synthesis*** was: _____.
    (a) Adolph Kolbe (c) Jons Jakob Berzelius
    (b) Friedrich Wohler (d) Isaac Newton

14. Making urea was partial synthesis because the final step had to be done inside the stomach of a sheep.
    (a) True or (b) False

15. Because acetic acid was made from hydrogen, carbon and oxygen, the process was called _____ ***synthesis***.
    (a) ***inorganic*** (b) ***partial*** (c) ***total*** (d) ***organic***

*16. _____ laws apply equally well to organic compounds as they do to inorganic compounds.

*17. According to the modern definition, an organic compound is one that: _____.
    (a) contains carbon (c) is made by the organs of living things
    (b) contains organisms (d) contains chemicals

*18. The one that is NOT an organic compound is: _____.
    (a) $C_{12}H_{22}O_{11}$ (b) H_2SO_4 (c) $C_6H_4(OH)COOH$ (d) $CO(NH_2)_2$

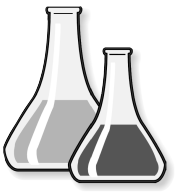
*19. Organic compounds such as food, vitamins, drugs and fuels all contain: _____.
    (a) carbon (b) hydrogen (c) nitrogen (d) oxygen

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

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Name: _____

Date: _____ Grade: _____



ACTIVITIES
Lesson 2:
Compounds

Hydrocarbons

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. _____ is the essential element in all organic compounds.

*2. Carbon is but one of the _____ naturally occurring elements in the universe.

*3. The element that forms the greatest number of different compounds is: _____.
(a) oxygen (b) carbon (c) hydrogen (d) nitrogen

4. Today, _____ million chemicals have been studied for their benefits and harmful effects.

*5. The vast majority of the chemicals that have been studied are _____ compounds.

*6. A compound that contains only carbon and hydrogen is a(n): _____.
(a) catalyst (b) carbon hydride (c) hydrocarbon (d) alcohol

*7. The simplest ***hydrocarbon*** is: _____
(a) ethylene (b) formaldehyde (c) butane (d) methane

8. In a ***structural formula***, each dash represented two _____ electrons

*9. Methane, ethane and propane are examples of hydrocarbon: _____.
(a) chains (b) isomers (c) pyramids (d) ions

10. As the length of a carbon chain increases, the number of possible *isomers*:
_____.
(a) grows exponentially (c) increases
(b) decreases (d) remain the same

11. Normal butane and _____ have the same elements in the same number.

*12. Isomers have the same chemical formula and the same chemical and physical properties.
(a) True or (b) False

*13. The formula for heptane is: _____.
(a) CH_4 (b) C_3H_7 (c) C_2H_6 (d) C_7H_{16}

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*14. The formula for isooctane is _____.

15. Compared to heptane alone, blending isooctane with heptane _____ engine performance.
(a) improves (b) reduces (c) dilutes (d) has no effect on

*16. The purpose of catalytic converters is to: _____.
(a) remove lead
(b) convert unburned hydrocarbons into less harmful compounds
(c) increase gas mileage
(d) be a catalyst

17. _____ is used as a sealant and to make torches.
(a) ***Petroleum*** (b) ***Pitch*** (c) Asphalt (d) Paraffin

*18. The _____ family of hydrocarbons is also known as the *paraffin* series.

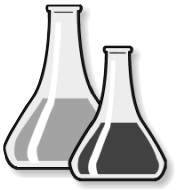
19. Paraffin is used to make wax paper because it does not burn.
(a) True or (b) False

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

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Name: _____

Date: _____ Grade: _____



Saturated and Unsaturated Hydrocarbons

ACTIVITIES
Lesson 3:
Compounds

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. Most of the ***asphalt*** produced in the United States goes into: _____.
   (a) sidewalks (c) making gasoline
   (b) making roofing tile (d) highway construction

*2. Hydrocarbons are compounds made entirely of carbon and: _____.
   (a) hydrogen (b) methane (c) nitrogen (d) oxygen

*3. As hydrocarbon chains grow longer, the molecules become: _____.
   (a) lighter (b) heavier (c) magnetic (d) darker

*4. As hydrocarbon chains grow longer, they change from solids to liquids and then to gases.
   (a) True or (b) False

5. Long hydrocarbon chains are inert (or _____ active).

6. Hydrocarbon chains with _____ or more carbon atoms are solids.

7. Hydrocarbons such as paraffin are ***insoluble*** in _____.

*8. Gasoline and water do not mix. (a) True or (b) False

*9. _____ _____ will take an oil stain out of clothing.

*10. Methane, ethane and butane are members of the _____ series.
   (a) ***alkane*** (b) ***alkene*** (c) alkyne (d) petrol

*11. In a _____ molecule, every carbon has single bonds.

*12. An alkane hydrocarbon with 24 carbon atoms has _____ hydrogen atoms.

*13. In a ***saturated*** hydrocarbon, all of the bonds have single _____ bonds.

*14. An _____ molecule has room for additional hydrogen atoms.

*15. The double bond, C = C, represents _____ electrons that are being shared.

16. Because ethylene has a double bond between two carbon atoms, it is _____.

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*17. Hydrocarbon molecules that have at least one double bond are members of the _____ series.
(a) paraffin (b) alkane (c) alkene (d) alkyne

*18. The molecule made of many connected ethylene molecules is: _____.
(a) monoethylene (b) polybutyl (c) ***polyethylene*** (d) biethylene

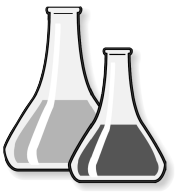
19. Milk is sold in white, translucent ***plastic*** jugs made of: _____.
(a) acetylene (b) paraffin (c) rubber (d) polyethylene

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

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Name: _____

Date: _____ Grade: _____



ACTIVITIES
Lesson 4:
Compounds

Black Gold

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 formula for *acetylene* is: _____.
(a) C_3H_8 (b) C_2H_6 (c) C_2H_4 (d) C_2H_2

*2. The one that is more reactive, especially when burned with oxygen, is: _____ _____.
(a) ethane with a single bond (c) ethylene with a double bond
(b) kerosene (d) acetylene with a triple bond

*3. Motor fuel, heating oil and coal all contain:_____.
(a) carbon (b) chlorine (c) gasoline (d) oxygen

*4. An organic compound always contains: _____.
(a) carbon (b) hydrogen (c) oregano (d) oxygen

5. Petroleum is a raw material for making carbon products.
(a) True or (b) False

6. The product extracted from ***shale*** is: _____.
(a) paraffin (b) *coal oil* (c) ***kerosene*** (d) gasoline

7. Both coal oil and kerosene are liquid: _____.
(a) juices (b) solids (c) cleaning fluids (d) hydrocarbons

*8. The word *petroleum* means "_____ _____."

9. The first person to drill a successful oil well in the United States was: _____.
(a) August Otto (b) Edwin L. Drake (c) George Hatfield (d) James Young

*10. Before the invention of the automobile, the main product of petroleum was _____.
(a) alabaster (b) kerosene (c) paraffin (d) whale oil

11. The name *black gold* refers to crude oil.
(a) True or (b) False

*12. Methane and propane are both: _____.
(a) hydroxyls (b) solids (c) liquids (d) gases

*13. Gasoline, kerosene and fuel oils are all: _____.
(a) solids (b) hydrides (c) liquids (d) gases

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14. The fuel that is less flammable is: _____.
(a) fuel oil (b) gasoline (c) heptane (d) kerosene

15. Petroleum jelly, asphalt and paraffin are all: _____.
(a) solids (b) liquids (c) gases (d) octanes

16. Grease keeps metal surfaces from rubbing against each other, reducing friction.
(a) True or (b) False

17. Petroleum jelly, known by the brand name of _____, is thicker than grease and is a solid.

Write 1 to 7 in each blank to place these petroleum products in order from the lightest, shortest molecule (1) to the longest, heaviest molecule (7).

18. _____ asphalt

19. _____ fuel oils

20. _____ gasoline

21. _____ kerosene

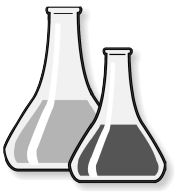
22. _____ lubricating oils and greases

23. _____ natural gas

24. _____ petroleum jelly

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

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ACTIVITIES
Lesson 5:
Compounds

Benzene

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. Of all the hydrocarbons, _____ presented the greatest mystery to chemists.

*2. The formula for *benzene* is _____.

3. Because only hydrogen atoms bonded with the six carbon atoms in bezene, it was clear to chemists that benzene is _____.

*4. Normally, a compound with ***double*** or ***triple bonds*** is chemically: _____.
(a) unstable (b) active (c) inert (d) stable

*5. Compared to compounds with single bonds, benzene is _____ active.
(a) more (b) exceptionally (c) less (d) equally

*6. *Aromatic compounds* contain benzene. (a) True or (b) False

*7. Almost all artificial dyes, flavors and perfumes are ***derived*** from _____.

*8. The benzene molecule has the shape of a(n): _____.
(a) isomer with numerous side chains (c) trapezoid
(b) long chain (d) ring

*9. Benzene serves as the starting resource for a great number of other organic compounds.
(a) True or (b) False

*10. The proportion of organic compounds that have a ring structure is _____ of all organic compounds.
(a) less than one percent (c) about half
(b) more than ninety percent (d) beyond imagination

11. The benzene rings that make naphthalene: _____.
(a) have nitrogen atoms
(b) are hooked together by hydrocarbon chains
(c) have common sides
(d) are hooked together like the links of a chain

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12. *Aniline* is similar to benzene except one of the hydrogen atoms has been replaced with: _____.
(a) chlorine (b) *NaCl* (c) freon (d) the NH_2 group

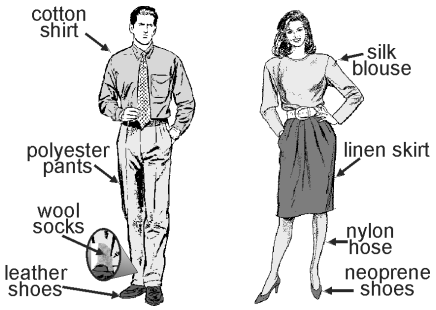
13. William Henry Perkin made the first artificial dye from _____.

*14. A _____ compound is made in the laboratory by combining elements or groups of elements.

15. A *synthetic* compound is never identical to one found in nature.
(a) True or (b) False

16. **Classify the clothing items on the right in the chart:**

Natural	Synthetic



17. During World War II, Germany used synthetic fuel because it was cheaper.
(a) True or (b) False

18. William Henry Perkin started an entire industry based on a _____ product.

19. The best-known purple ***dye*** was _____ purple that came from a shellfish in the Mediterranean Sea.

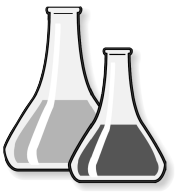
20. Although William Henry Perkin became a successful businessman, other scientists considered him a failure as a chemist.
(a) True or (b) False

21. 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:
Compounds

Organic Acids and Ethers

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 sting of bees, wasps and the bites of ants all contain an organic _____.

*2. The functional ***carboxyl*** group of organic acids is: _____.
(a) O_2H (b) *COOH* (c) *OH* (d) *HOOC*

*3. The formula for ***formic*** acid is _____.

*4. The formula for acetic acid is _____.

*5. The simplest of the *organic acids* is _____ acid.
(a) acetic (b) butyric (c) formic (d) lactic

6. Plants known as _____ _____ have stems filled with formic acid, which can irritate the skin.

7. Formic acid is used in the chemical industry for tanning hides, for dyeing fabrics and for producing of _____.

8. Formica is not very useful for kitchen and bathroom countertops.
(a) True or (b) False

*9. *Formaldehyde* is used to: _____.
(a) clean laboratory glassware (c) kill pest
(b) make the Formica (d) preserve specimens

10. One of the properties of ***acetone*** is that it is: _____.
(a) a hydrocarbon (c) a good solvent of organic material
(b) inorganic (d) inert

*11. Although strong for an organic acid, _____ _____ is weak compared to an inorganic acid such as sulfuric acid.

*12. The organic acid used in greater amounts than any other is _____ acid.
(a) ***lactic*** (b) *acetic* (c) ***butyric*** (d) *formic*

*13. _____ acid gives spoiled milk its sour taste.
(a) Lactic (b) Formic (c) Butyric (d) Acetic

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*14. An ether is an organic compound containing two hydrocarbon chains with a(n) _____ atom between them.
(a) carbon (b) hydrogen (c) ether (d) oxygen

*15. The formula for *dimethyl ether* is _____.

*16. The formula for *diethyl ether* is _____.

17. Diethyl ether is a _____ anesthesia.

18. The reason Crawford W. Long was not given credit for the discovery of ***ether*** as a *general anesthesia* was because: _____.
(a) he did not publish his results soon enough
(b) he was a dentist
(c) he was not from the United States
(d) several patients died

19. In modern surgery, the patient is made insensitive to pain by laughing gas.
(a) True or (b) False

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

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ACTIVITIES
Lesson 7:
Inventions & Discoveries

Plastics

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. Automobiles contain about 12 percent _____ by weight.

*2. The word ***plastic*** means: _____.
(a) flexible (b) brittle (c) capable of being molded (d) elastic

3. _____ _____ invented a photographic paper that could be viewed by artificial light during development.

4. _____ _____ of the Eastman Kodak Company paid Leo Baekeland one million dollars for the photographic paper that he invented.

5. Baekeland discovered _____ while searching for a substitute for shellac.

6. Baekeland's discovery was found to be very similar to a natural product.
(a) True or (b) False

7. Bakelite was used for only a few years before other plastics replaced it.
(a) True or (b) False

*8. A plastic that hardens permanently when it cools and does not become soft when reheated is a: _____.
(a) ***thermoplastic*** (c) ***thermosetting*** plastic
(b) hydrothermos plastic (d) hydroplastic setting

9. _____ is an example of a thermoplastic.

*10. *Polyethylene* is made from ethylene and has _____ bonds.
(a) single (b) double (c) permanent (d) triple

*11. Because the bonds in the molecules of polyethylene are single, it is chemically: _____.
(a) active (b) inert (c) volatile (d) inseparable

12. The natives of South America used ***rubber*** as a chewing gum.
(a) True or (b) False

13. In Europe, rubber was used to rub out _____ marks.

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*14. Rubber is a natural organic _____ obtained from rubber trees.
(a) ***monomer*** (b) ***polymer*** (c) binomial (d) monomial

15. Making an artificial substance with all of the desirable properties of rubber turned out to be very _____.

*16. The first synthetic rubber was based on _____, derived from acetylene and hydrochloric acid.

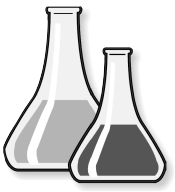
*17. _____ resists organic solvents, such as gasoline.
(a) Natural rubber (b) Neoprene (c) Butadiene (d) Polyvinylchloride

18. The letters *Na* in Buna stand for: _____.
(a) national (b) nature (c) sodium (d) not advised

*19. Mixing synthetic rubber with natural rubber: _____.
(a) improves the properties
(b) is not possible because synthetic rubber cannot be recycled
(c) must be avoided
(d) causes disintegration

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

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ACTIVITIES
Lesson 8:
Compounds

Alcohol

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 functional ***hydroxyl*** group that is characteristic of an alcohol is: _____.
(a) CH_4 (b) NH_2 (c) OH (d) CO

*2. The formula for methyl ***alcohol*** is _____.

*3. Methyl alcohol is also known as: _____.
(a) grain alcohol (b) wood alcohol (c) rubbing alcohol (d) glycol

*4. Methyl alcohol is also known as: _____.
(a) menthol (b) ethanol (c) methanol (d) grain alcohol

5. Methyl alcohol can prove _____ if consumed.

6. The formula for ethyl alcohol is _____.

*7. Intoxicating drinks contain _____ alcohol.
(a) ethanol (b) ***denatured*** (c) ethyl (d) methyl

*8. Habitual consumption of _____ _____ can cause liver, brain and kidney damage.

9. Ethyl alcohol is too expensive to be used as an automobile fuel.
(a) True or (b) False

*10. Ethyl alcohol is mixed with gasoline to produce _____.

11. To prevent people from drinking untaxed alcohol: _____.
(a) it is denatured (c) it must be classified as a *hydroxyl*
(b) prohibition was started (d) it must undergo a ***destructive distillation*** process

*12. The ones that mix better with water are: _____.
(a) bases (b) alcohols (c) hydrocarbons (d) bicarbonates

13. _____ is a liquid at room temperature.
(a) Ethylene (b) Methylene (c) Methane (d) Methyl alcohol

*14. Ethylene ***glycol*** has two *OH* groups and its formula is: _____.
(a) $C_2H_4(OH)_2$ (b) CH_3H_4OH (c) $C(OH)_2$ (d) $C_3H_5(OH)_3$

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15. The word _____ comes from a Greek word meaning *sweet*.

*16. A mixture of water and ethylene glycol makes a good _____ and summer coolant for use in automobile radiators.

17. Despite being pleasant tasting, ethylene glycol is _____.

*18. _____ is a colorless, odorless, thick, syrupy liquid that has a sweet taste.

*19. Glycerol is added to packaged cookies to: _____.

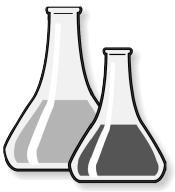
(a) make them explode
(b) give them an alcohol taste
(c) keep them fresh
(d) keep them moist

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

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Name: _____

Date: _____ Grade: _____



ACTIVITIES
Lesson 9:
Compounds

Changing Molecules

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. Louis Pasteur found that ***fermentation*** is caused by: _____.
(a) sugar that has been denatured (c) yeast cells
(b) vinegar that has gone sour (d) distilling

2. _____ is a single celled living organism that has no chlorophyll.

3. Fermentation is caused as the yeast release an _____ to dissolve food that absorbs through cell walls.

4. ***Zymase*** is an ***enzyme*** that converts sugar into vinegar and carbon dioxide.
(a) True or (b) False

*5. The enzyme is: _____.
(a) oxygen (b) ***lactose*** (c) ***lactase*** (d) lactic acid

*6. Gentle heating to kill microorganisms that cause foods to spoil is known as: _____.
(a) ***pasteurization*** (b) fermentation (c) ***cracking*** (d) denaturing

*7. The amount of gasoline derived from a barrel of crude oil can be increased by: _____.
(a) analysis (b) denaturing (c) cracking (d) synthesis

*8. The process of making the plastic such as polyethylene by attaching together identical smaller units is known as: _____.
(a) ***polymerization*** (b) ***reforming*** (c) cracking (d) ***substitution***

9. Chloroform and carbon tetrachloride are examples of compounds made by _____.

*10. The chemical formula for methane is _____.

*11. The chemical formula for chloroform is _____.

*12. The chemical formula for carbon tetrachloride is _____.

*13. The compound that is a hydrocarbon is: _____.
(a) carbon tetrachloride (c) methane
(b) chloroform (d) carbon dioxide

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14. The one property that methane, carbon tetrachloride and chloroform have in common is that they: _____.
    (a) are liquids at room temperature (c) are made by cracking
    (b) contain carbons (d) are made by substitution

5. Freon and teflon are fluorine substitution compounds of carbon.
    (a) True or (b) False

16. Normal butane and isobutane are _____.

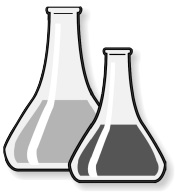
17. _____ has two isomers and is a chain while isobutane has a small side chain.

18. Ethyl alcohol and dimethyl ether are _____ of one another.

*19. Ethyl alcohol and dimethyl ether: _____.
    (a) are gases at room temperature (c) have the same chemical properties
    (b) are not related in any way (d) have the same number and type of atoms

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

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ACTIVITIES
Lesson 10:
Compounds

Carbohydrates

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. ***Carbohydrates*** contain carbon, hydrogen and _____.

2. Compared to other organic compounds, carbohydrates are: _____.
(a) abundant (b) scarce (c) difficult to find (d) very small

*3. ***Cellulose*** is a type of: _____.
(a) ***fat*** (b) alcohol (c) carbohydrate (d) organic acid

4. Wood is about _____ cellulose.
(a) three-fourths (b) twenty-five percent (c) half (d) ninety percent

5. Cotton has _____ cellulose than wood pulp.

6. Both cotton and flax are natural fibers. (a) True or (b) False

*7. The digestion of cellulose in cows is done by: _____.
(a) artificial resuscitation
(b) enzymes released by bacteria in the cow's stomach
(c) the third stomach
(d) chemicals the cows produce as they chew the food

*8. _____ is a simple ***sugar*** necessary for life.

*9. *Starch* is a type of: _____.
(a) alcohol (b) carbohydrate (c) enzyme (d) laundry additive

*10. About half of the world's supply of food energy comes from: _____.
(a) China (c) cotton, flax and wood pulp
(b) ants and cattle (d) starch in cereals, potatoes and rice

*11. Starch is a _____ carbohydrate.

*12. The formula for *glucose* is _____.

*13. The primary energy source for the body is: _____.
(a) carbohydrates (b) vitamins (c) fats (d) glucose

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*14. The primary purpose of ***insulin*** is to: _____.
(a) digest cellulose
(b) increase the rate the heart beats
(c) keep a person alert
(d) regulate the amount of *blood sugar*

15. The body produces ***glycogen*** from excess: _____.
(a) glucose (b) fat (c) glycerin (d) calories

16. Foods that provide quick energy but little else are referred to as having empty _____.

*17. Table sugar is known as ***sucrose*** and: _____.
(a) Sweet n Low (b) cane sugar (c) fructose (d) glucose

*18. The formula for sucrose is _____.

*19. ***Fructose*** is found in: _____.
(a) cellulose (b) all nature (c) fruits (d) milk

20. _____ is used in infant formula because it is easy to digest.
(a) Fructose (b) Glucose (c) *Lactose* (d) *Maltose*

21. ***Fats*** are a type of carbohydrate. (a) True or (b) False

22. All fats are solid. (a) True or (b) False

23. One purpose of fat in an animal's body is to store excess _____.

24. French fries are often deep fried in the fat known as: _____.
(a) avignone (b) lard (c) olive oil (d) grease

25. Consuming fat from mammals contributes to _____ disease.

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

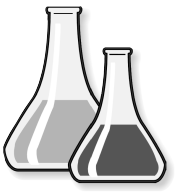
Note: Ask your teacher for the quiz over topics 6-10 before proceeding to the next section. Reminder: If you score 85% or higher on the three section quizzes, you may be exempt from the chapter test!



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Name: _____

Date: _____ Grade: _____



ACTIVITIES
Lesson 11:
Compounds

Nitrogen Compounds and Fibers

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. Although nitrogen forms weak bond with other elements, the covalent bond between the two nitrogen atoms is _____.

*2. _____ is essential for life.

*3. Nitrogen can be removed from the atmosphere and put in compounds that plants can use by lightning and: _____.
(a) leaves of plants (c) ***nitrogen-fixing bacteria***
(b) nitric acid (d) thunder

*4. As crops are grown, the first three elements depleted from the soil are potassium, phosphorus and _____.

*5. Chemicals, whether natural or synthetic, that restore minerals to the soil are called _____.

6. The *nitrogen cycle* shows that the only way animals can get nitrogen is from other animals.
(a) True or (b) False

*7. Nitrogen makes explosives because its bonds are extremely: _____.
(a) hazardous (b) stable (c) unstable (d) simple

8. The only use of explosions is in time of war. (a) True or (b) False

9. The letters, TNT, come from the: _____.
(a) letters of tri-nitro-toulene (c) code word used during its secret development
(b) letters of tetra-nitric-tricyclin (d) initials of inventor, Thomas N. Tinker

10. TNT is the strongest explosive known. (a) True or (b) False

*11. Explosives are: _____.
(a) natural (b) synthetic (c) expensive (d) superficial

12. _____ is made from the bark of a tree that grows in Asia and South America.

13. ***Celluloid*** is clear and strong like glass but more _____.

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14. The one with the greater fire risk is: _____.
(a) rayon (b) celluloid (c) nylon (d) nitrogen

15. _____ is made from cellulose.

16. Rayon is a _____ fiber used to make a variety of fabrics, including carpet.

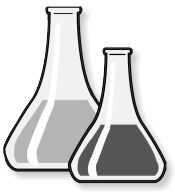
*17. Cotton and flax are: _____.
(a) ***synthetic fibers*** (b) animal fibers (c) mineral fibers (d) plant fibers

*18. Wool and silk are: _____.
(a) animal fibers (b) synthetic fibers (c) ***suture*** fibers (d) plant fibers

*19. Nylon is from: _____.
(a) animal fibers (b) mineral fibers (c) plant fibers (d) synthetic fibers

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

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ACTIVITIES
Lesson 12:
Compounds

Vitamins

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. ***Scurvy*** became a real problem when the length of sea voyages increased.
   (a) True or (b) False

2. James Lind was a Scottish: _____.
   (a) admiral (b) lime merchant (c) physician (d) king

*3. The sailors who were cured of scurvy in James Lind's experiments daily ate: _____.
   (a) only vitamins (c) polished rice
   (b) a variety of spices (d) two oranges and a lemon

4. James Lind's study of scurvy had an immediate impact on the British navy.
   (a) True or (b) False

5. During Captain Cook's voyage in which he gave his men lime juice, the number that died was _____.

*6. The nickname for British sailors is "_____."

*7. A ***vitamin deficiency disease*** such as Scurvy is caused by a: _____.
   (a) bacterial infection (c) lack of a certain nutrient
   (b) type of pneumonia (d) mysterious germ

*8. The word *vitamin* is from a Latin word meaning: _____.
   (a) foul tasting (b) friendly (c) energy (d) life

*9. The condition caused by too little vitamin A is night: _____.
   (a) blindness (b) sleep walking (c) vision (d) shifting

*10. The condition caused by too little vitamin C is _____.

*11. Vitamin D can be created in the body by the action of _____ light.

*12. ***Rickets*** is the disease caused by a lack: _____.
   (a) vitamin A (b) vitamin C (c) vitamin D (d) vitamin E

13. One synthetic source of vitamin _____ is whole milk.

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14. Vitamin _____ is necessary for heart health and good circulation.

*15. Vitamin K is produced in the intestines by the action of bacteria on leafy, green _____.

*16. Vitamin K promotes the clotting of _____.

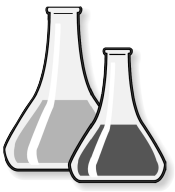
17. Vitamins are _____ to life.

18. An excess of a vitamin cannot be toxic or eliminated.
(a) True or (b) False

*19. People who live on processed food (like fast food, canned food and packaged "instant" meals) should take _____ supplements and consume fresh foods and juices.

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

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ACTIVITIES
Lesson 13:
Compounds

Vitamins and Protein

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 treatment for ***beriberi*** was found at about the same time as the cure for scurvy.
   (a) True or (b) False

2. The purpose of the ***Dutch*** East Indies Company was to: _____
   _____.
   (a) collect interesting scientific specimens (c) send missionaries to the Orient
   (b) engage in trade (d) protect colonists

3. While on his first trip to Java, Christiaan Eijkman fell victim to: _____.
   (a) scurvy (b) beriberi (c) malaria (d) yellow fever

4. Beriberi means: _____.
   (a) "broken wing" (c) "chills and sweats"
   (b) "good tasting" (d) "I cannot"

5. When appointed to the team to study beriberi, Christiaan Eijkman refused to return to Java.
   (a) True or (b) False

6. Husks were removed from rice because they: _____.
   (a) had a disagreeable color (c) tasted bad
   (b) contained butterfat that could spoil easily (d) needed work to do

7. The chickens became sick with a disease like beriberi when the cook fed them:
   _____.
   (a) brown rice (b) ground beef (c) polished white rice (d) bananas

8. Most doctors _____ Christiaan Eijkman's report that brown rice prevented beriberi.
   (a) rejected (b) accepted (c) ignored (d) rejoiced about

*9. Brown rice prevents beriberi because the husk contains _____.

10. Christiaan Eijkman died before the Nobel Prize was awarded to him.
    (a) True or (b) False

*11. Vitamins generally are catalysts that help _____ do their work in the body.

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*12. The four most common elements in proteins are carbon, oxygen, hydrogen and: _____.
(a) aluminum (b) ***helix*** (c) neon (d) nitrogen

13. The name ***protein*** comes from a Greek word meaning "of first _____."

14. Scientists estimate that the human body has about _____ different types of protein molecules.

*15. The shape of protein molecules is due to the bond created by the hydrogen atom.
(a) True or (b) False

16. Hydrogen forms only ionic compounds.
(a) True or (b) False

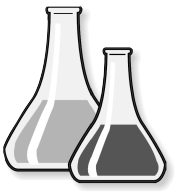
*17. The three-dimensional shape of a protein molecule is caused by the number and location of _____ atoms.
(a) carbon (b) hydrogen (c) oxygen (d) nitrogen

18. Many protein molecules form a _____ structure.

*19. The spiral shape of the protein molecules is known as a _____.

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

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ACTIVITIES
Lesson 14:
Compounds

Protein

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 building blocks of *proteins* are _____ _____.

*2. Proteins are large molecules of _____ _____ that are joined together.

3. The protein that makes hair, silk, wool and fur is: _____.
(a) collagen (b) flax (c) ***keratin*** (d) virus

4. The protein that makes tendons, ligaments and cartilage is: _____.
(a) keratin (c) *collagen*
(b) *complete proteins* (d) *incomplete proteins*

*5. _____ is a flexible but tough form of collagen and changes into bones.

*6. ***Gelatin*** is derived by: _____.
(a) an incomplete protein and vitamin (c) bacteria acting on milk
(b) making jelly (d) boiling collagen

7. The word *collagen* is from a Greek word meaning "_____."

8. Frederick Gowland Hopkins was the doctor who discovered the ____ vitamin complex.

9. Dr. Hopkins worked with the concept of _____ amino acids.

*10. The human body _____ make all twenty of the amino acids.

11. Nuts and seeds from plants contain only incomplete protein.
(a) True or (b) False

*12. _____ _____ contain all of the *essential amino acids*.

13. Dietary diseases caused by the lack of amino acids are _____ in the United States.

*14. The primary use of protein is to: _____.
(a) grow and repair tissue (c) energize
(b) absorb carbon dioxide (d) coat nerve endings

*15. A ***virus*** is all protein. (a) True or (b) False

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16. Many of the most difficult diseases to overcome, such as the common cold, AIDS and influenza, are caused by _____.

*17. ***Antibodies*** are another group of _____ that the body produces.
(a) bacteria (b) hydrocarbon (c) proteins (d) ***toxins***

*18. The person who has one case of certain childhood diseases usually becomes _____ to it because _____ remain in the bloodstream.

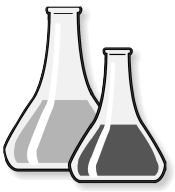
19. A disease can only be fought by antibodies produced by the body of the person infected by the disease.
(a) True or (b) False

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

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Name: _____

Date: _____ Grade: _____



Colloids and Other Elements in Organic Compounds

ACTIVITIES
Lesson 15:
Compounds

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. Jelly, custard and pudding are examples of a(n): _____.
   (a) aerosol (b) ***colloid*** (c) ***solution*** (d) ***suspension***

*2. The one that has the smallest particles is a(n): _____.
   (a) aerosol (b) colloid (c) solution (d) suspension.

*3. The particles of a colloid will pass through a paper filter.
   (a) True or (b) False

4. Filtering out the particles in a colloid is _____.

*5. When the _____ fail, the person can survive with a kidney transplant.

*6. _____ is the selective separation of molecules through a ***semipermeable membrane*** based on their size.

7. A ***gel*** is a colloid that is a: _____.
   (a) gas (b) vapor (c) liquid (d) solid

8. Carbon, hydrogen, oxygen and nitrogen make up about _____ percent of the human body weight.

9. Sulfur is not found in organic compounds.
   (a) True or (b) False

*10. The odor of rotten eggs is due to: _____.
   (a) hydrocarbons (b) *hydrogen sulfide* (c) breakage (d) mercury

11. The spray of skunks contains: _____.
   (a) hydroxide (b) sulfur (c) nitrate (d) rotten eggs

*12. When a child gets into acidic, poisonous household chemicals, the poison can be countered by _____ _____, more commonly known as Baking Soda, which can neutralize the acid.

*13. An ***antidote*** is taken to counter: _____.
   (a) any type of dote (c) an upset stomach
   (b) a severe sunburn (d) the harmful effects of a poison

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14. The human skeleton is made entirely of calcium phosphate.
(a) True or (b) False

*15. Iron, magnesium, iodine and cobalt are described as _____ elements.
(a) essential (b) useable (c) missing (d) trace

16. The body requires _____ inorganic compounds.

*17. The body of an average person consumes _____ quarts or 20 glasses of water every day.

18. The only way the human body receives water is by drinking it.
(a) True or (b) False

19. Some animals can live without _____ water.

20. 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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