**BIOLOGICA: Chemistry in Biology Game Menu NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| **OBJECTIVES** | **1.** Investigate the properties and importance of water and its significance for life: surface tension, adhesion, cohesion, polarity, pH  **2.** Describe the structure and function of the four organic molecules found in living systems: carbohydrates, lipids, nucleic acids, proteins (i.e. enzymes)  **3.** Construct and revise an explanation based on evidence for how carbon, hydrogen, oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules  **4.** Describe the relationship between an enzyme and its substrate molecule(s)  **5.** Explain the role of energy in chemical reactions of living systems: activation energy, exergonic reactions, endergonic reactions |
| **VOCABULARY** | **25 words:** adhesion, cohesion, polarity, surface tension, pH, hydrogen bonding, organic compound, inorganic compound, monomer, polymer, lipid, fat, carbohydrate, monosaccharide, disaccharide, polysaccharide, protein, catalyst, activation energy, dehydration synthesis reaction, hydrolysis reaction, product, reactant, endergonic reaction, exergonic reaction |

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| **Topic (\* Review topic)** | **Player’s Choice** | **Scripted Play** |
| Vocabulary | \_\_\_\_\_20 pts Vocab review WS | \_\_\_\_\_ 50 pts Basic Vocab-define, illustration/example,  Advanced Vocab 75 pts- define,illustrate/example,use |
| Labs | Labs—\*\*Choose a third of your choice (from computer simulation labs listed) | Labs—2 mandatory; 3rd of choice |
| Academic Levels Assessments | Advanced—Must do 3 SoULs from any of the 5 non-review topics;  Written test OR Project (layout lab with questions & answers, video lecture, complex model)  Basic—Must do 1 SoUL from any of the 5 non-review topics;  Written test only | SoUL—3 for Advanced, 1 for Basic  Written test—Advanced or Basic  Project—Advanced only |
| \*Atoms—sub-particles, characteristics of each, structure, behavior due to structure | \_\_\_\_\_10 pts Read text Ch 2-1 and take notes  \_\_\_\_\_10 pts Chemistry in Biology Class notes, read and process notes  \_\_\_\_\_10 pts Atomic structure in-class video (2:18 mins) & WS  \_\_\_\_\_10 pts Chemistry powerpt (atoms)from Biology Junction, watch and take notes  \_\_\_\_\_20 pts Introduction to Atoms video (21:04 mins) on class website, watch & take notes |  |
| \*Compounds/Molecules —combinations, sizes, examples important to life | \_\_\_\_\_10 pts Read text Ch 2-1 and take notes  \_\_\_\_\_10 pts Class notes, read and process notes  \_\_\_\_\_10 pts Elements & compounds video (2:38 mins) on class website, watch & take notes  \_\_\_\_\_10 pts Chemistry powerpt (compounds&molecules)from Biology Junction, watch & take notes |  |
| \*Types of bonds—ionic, covalent (polar, nonpolar), hydrogen bonds | \_\_\_\_\_10 pts Read text Ch 2-1 and take notes  \_\_\_\_\_10 pts Class notes, read and process notes  \_\_\_\_\_10 pts Energy levels & Ionic bonding in-class video (1:58 mins) & WS  \_\_\_\_\_10 pts Covalent bonding in-class video (1:39 mins) & WS  \_\_\_\_\_20 pts Chemical bonds: covalent & ionic video (8:57 mins) on class website, watch & take notes  \_\_\_\_\_20 pts Hydrogen bonding video (8:59 mins) on class website, watch and take notes |  |
| Properties of water—surface tension, adhesion, cohesion, polarity, importance to life | \_\_\_\_\_10 pts Read text Ch 2-2 and take notes  \_\_\_\_\_10 pts Class notes, read and process(hilite/underline)  \_\_\_\_\_20 pts Water & life video ( 10:45 mins) on class website, watch and take notes  \_\_\_\_\_20 pts Water: a polar molecule video (8:36 mins) on class website, watch & take notes  \_\_\_\_\_20 pts Water-adhesion, cohesion, surface tension video (7:02 mins) on class website, watch & take notes  \_\_\_\_\_20 pts Water polarity video (8:45 mins) on class website, watch and take notes | \_\_\_\_\_70 pts Water properties lab  \_\_\_\_\_50 pts SoUL (eligible) |
| pH—scale, examples, importance | \_\_\_\_\_10 pts Read text Ch 2-2 and take notes  \_\_\_\_\_10 pts pH color page, color and hilite/underline notes  \_\_\_\_\_20 pts Acids, bases & pH video ( 8:53 mins) on class website, watch &take notes  \_\_\_\_\_50 pts pH analysis sim lab | \_\_\_\_\_50 pts SoUL (eligible) |
| Organic molecules—Carbohydrates, Lipids, Nucleic acids, Proteins; structure, characteristics of each, most common elements in them/life, functions, building blocks of each, formation of each, importance to life | \_\_\_\_\_10 pts Read text 2-3 and take notes  \_\_\_\_\_10 pts Organic chem Class notes, read and process notes  \_\_\_\_\_20 pts Elements in living things foldable  \_\_\_\_\_20 pts Biochem & cells powerpt at Biology Junction on class website, watch& take notes  \_\_\_\_\_20 pts Macromloecule powerpt at Biology Junction on class website, watch& take notes  \_\_\_\_\_20 pts Carbohydrate powerpt at Biology Junction on class website, watch& take notes  \_\_\_\_\_20 pts Lipids powerpt at Biology Junction on class website, watch & take notes  \_\_\_\_\_20 pts Nucleic acids powerpt at Biology Junction on class website, watch & take notes  \_\_\_\_\_20 pts Proteins powerpt at Biology Junction on class website, watch and take notes  \_\_\_\_\_20 pts The molecules of life video (10:46 mins) on class website, watch and take notes  \_\_\_\_\_20 pts Biological molecules video (15:19 mins) on class website, watch and take notes  \_\_\_\_\_20 pts Carbohydrate video ( 8:48 mins) on class website, watch and take notes  \_\_\_\_\_20 pts Lipids video (7:05 mins) on class website, watch and take notes  \_\_\_\_\_20 pts Nucleic acid video (8:00 mins) on class website, watch and take notes  \_\_\_\_\_20 pts Proteins video (9:15 mins) on class website, watch and take notes  \_\_\_\_\_50 pts Identifying nutrients sim lab  \_\_\_\_\_20 pts Chem of life/Organic compound concept map (2 versions) | \_\_\_\_\_50 pts Organic molecules organizer  \_\_\_\_\_50 pts SoUL (eligible) |
| Enzymes—structures, functions, importance | \_\_\_\_\_10 pts Read text 2-4 and take notes  \_\_\_\_\_10 pts Enzyme Class notes, read and process notes  \_\_\_\_\_10 pts Enzyme color page, read/process& color  \_\_\_\_\_20 pts Enzymes powerpt at Biology Junction on class website, watch & take notes  \_\_\_\_\_15 pts Enzyme word scramble WS  \_\_\_\_\_10 pts Enzymatic reactions in-class video (1:44 mins) & WS  \_\_\_\_\_20 pts Enzymes video (11:51 mins) on class website, watch and take notes  \_\_\_\_\_20 pts Enzyme catalysis (AP bio) video(6:45 mins) on class website, watch & take notes  \_\_\_\_\_10 pts Activation energy video (4:51 mins) on class website, watch & take notes  \_\_\_\_\_50 pts Collision theory sim lab | \_\_\_\_\_50 pts Penny-ase enzyme lab  \_\_\_\_\_50 pts SoUL (eligible) |
| Types of chemical reactions—activation energy, endergonic, exergonic, reactions used to form/break down organic molecules | \_\_\_\_\_10 pts Read text 2-4 and take notes  \_\_\_\_\_10 pts Chemical reactions Class notes, read and process  \_\_\_\_\_20 pts Bioenergetics powerpoint at Biology Junction on class website  \_\_\_\_\_20 pts Ch 2B Dehydration synthesis& hydrolysis video(13:00 mins)on class website, watch & take notes  \_\_\_\_\_50 pts Dehydration synthesis sim lab | \_\_\_\_\_50 pts SoUL (eligible) |
| 600 Points TOTAL  for Unit | Advanced players choice 155 pts  Basic players choice 280 pts | Advanced scripted 445 pts  Basic scripted 320 pts |

POINT LEVELS: A=540+pts B=480-539 pts C=420-479 pts D=360-419 pts F=359 pts and below