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Class _____

ESSENTIAL VOCABULARY FOR BIOLOGY STAAR

Vocabulary Term	Scientific definition – what a textbook might say	Student definition – how do YOU understand this, in 10 words or less?	Draw a picture or give an example of this vocabulary term.
1. Science	Use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process		
2. Hypothesis	Tentative and testable statement that must be capable of being supported by observational evidence		
3. Theory	Well-established and highly reliable explanation that has been tested by many scientists and may change as new information emerges		
4. Prokaryote	A unicellular (1-celled) organism that lacks a nucleus.		
5. Eukaryote	Any organism with a nucleus in its cells		
6. Homeostasis	Organisms maintaining a constant internal balance, keeping things stable.		
7. Virus	A nonliving combination of protein and DNA or RNA that cannot reproduce unless it has infected a host cell		
8. Cells	The smallest living structure that is common among all living organisms – contains DNA, a cell membrane, and other structures		
9. HIV	(Human Immunodeficiency Virus) A sexually transmitted disease in humans in which a virus kills immune system cells		
10. Influenza	An airborne disease in which a virus attacks respiratory cells, also known as “the flu.”		
11. DNA Replication	The cellular process of making a copy of DNA; necessary in order for a cell to divide		

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12. Mitosis	The process of cell division – consists of several steps (prophase, metaphase, anaphase, telophase...)		
13. Cell Cycle	The repeating process of cell growth and reproduction through mitosis		
14. Roots	Tissues that plants use to absorb water and minerals from the soil		
15. Stems	Tissues in plants that are necessary for transport – contain xylem and phloem		
16. Leaves	Tissues in plants where photosynthesis occurs – have guard cells on the bottom side		
17. Blood	Tissue in animals that transports oxygen, nutrients, and wastes around the body		
18. Muscle	Tissue in animals that allows movement and control of organs like the heart		
19. Epithelium	Tissue in animals that acts as a barrier on the exterior of the body or around an internal organ		
20. DNA	Deoxyribonucleic acid – the molecule that carries genetic information and instructions for the function of all cells		
21. RNA	Ribonucleic acid – a molecule similar to DNA that can be used in ribosomes (rRNA), for carrying amino acids (tRNA), or for carrying a DNA message (mRNA)		
22. Cell differentiation	A process that occurs during embryonic development in which cells and tissues become specialized		
23. Cancer	A disorder in which the cell cycle is no longer controlled and cells divide uncontrollably		

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24. Sugar-Phosphate Backbone	A structure in the DNA double helix structure that alternates a sugar (deoxyribose) with phosphates to make each side of the DNA strand		
25. Nitrogen base	A, C, T, G – the structures that bond to sugar in the DNA molecule and make the “rungs” of the ladder		
26. Nucleotide	The combination of a sugar, a phosphate, and a nitrogen base – the building blocks of DNA and RNA		
27. Trait	An inherited characteristic that can be observed about an organism		
28. Genetic Code	The system that is used to translate DNA instructions into making proteins – this system is the same in all living things		
29. Transcription	The process of making an mRNA copy of a DNA strand. Occurs in the nucleus of the cell.		
30. Translation	The process of turning an mRNA code into a specific protein – happens at the ribosomes.		
31. Codon	A set of three letters of RNA that code for an amino acid		
32. Gene Expression	The combined processes of transcription and translation		
33. Regulation	Controlling or limiting the rate of a biological process		
34. Mutation	A change in the sequence of an organism’s DNA		
35. Genotype	The set of alleles an individual has for a particular trait – usually a pair of alleles		
36. Phenotype	The physical trait that is displayed based on an individual’s genotype		

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37. Allele	A version of a gene that is present in the population		
38. Dominant	A type of trait that is displayed phenotypically if an individual has <u>at least one</u> dominant allele		
39. Recessive	A type of trait that is only shown when <u>all/both</u> of an individual's alleles are the same		
40. Codominance	A genetic trait that has more than 3 or more alleles, with at least two being dominant at the same time		
41. Incomplete dominance	A trait in which individuals who are heterozygous show a phenotype that is somewhere in between the dominant and recessive traits		
42. Heterozygous	Having one dominant allele and one recessive allele for a trait		
43. Homozygous	Both alleles are the same – either both dominant or both recessive		
44. Meiosis	The process of cell division that results in gametes (eggs and sperm). The gametes have half the chromosomes of the adult organism.		
45. DNA fingerprinting	The use of DNA samples to identify a person – often used in crime scene investigations.		
46. Genetic modifications	Making changes to the DNA sequence of an organism - used in agriculture to increase crop production		
47. Chromosomal analysis	Also known as karyotyping – using an image of an individual's chromosomes to determine gender or disease		
48. Genome	The full sequence of an individual's DNA		

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49. Common ancestor	Any species from which two or more organisms evolved – it is an ancestor of both species.		
50. Biogeography	The places where different populations have lived on earth throughout geologic history – evidence of evolution.		
51. Fossil record	Evidence for evolution coming from samples of fossils of various times that show homologies.		
52. Homology	A similarity that still exists between different species that have a common ancestor – evidence for evolution.		
53. Natural selection	Organisms that are best adapted to their environment survive and reproduce, passing on favorable characteristics.		
54. Inherited variation	A trait that an individual organism has that is different from others of the species and that passes down genetically.		
55. Finite	Limited, having only a certain amount of something (often applies to resources like food).		
56. Environmental resources	Materials needed for the survival of living things that are found in the environment (light, food, water, etc.)		
57. Survival of the Fittest	Individuals who are best adapted to their environment survive, while others are killed by predators or adverse conditions.		
58. Adaptation	A characteristic of an organism that helps it survive in its environment.		
59. Diversity	Genetic differences among organisms of the same species or of different species in a community.		
60. Genetic Drift	Changes in the DNA makeup of a population due to random chance (usually occurs in small populations)		

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61. Gene Flow	Changes in the DNA makeup of a population due to interbreeding with another population.		
62. Recombination	A reshuffling of genes that usually occurs when parental DNA is combined to form offspring.		
63. Endosymbiotic theory	A theory that states that eukaryotes originated from prokaryotes living inside other prokaryotic cells, forming mitochondria and chloroplasts.		
64. Taxonomy	Classification of organisms based on similarities in structure, genetics, origin, etc.		
65. Archae	Microorganisms that were probably the first on Earth – many live in extreme environments.		
66. Bacteria	Unicellular, prokaryotic organisms that have cell walls, cell membranes, DNA, and lack a nucleus.		
67. Protists	Eukaryotic microorganisms with many different structures – most are unicellular.		
68. Fungi	Eukaryotic, multicellular organisms with cell walls. Get nutrients through decomposition or parasitism.		
69. Plants (Plantae)	Eukaryotic, multicellular organisms with cell walls and chloroplasts. Photosynthesis for energy.		
70. Animals (Animalia)	Eukaryotic, multicellular organisms with no cell wall or chloroplasts. Most have complex organs and organ systems. Heterotrophs		
71. Biomolecule	A molecule (chemical compound) that is important for life. Most contain C, H, and O, and are polymers of smaller subunits.		

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72. Carbohydrate	A biomolecule that is used for energy and made up of sugars (monosaccharides).		
73. Lipid	A biomolecule that is used for energy storage and insulation/protection. Made of triglycerides.		
74. Protein	A biomolecule that is often an enzyme to speed up chemical reactions in cells. Made from amino acids.		
75. Nucleic Acid	A biomolecule that carries genetic information – includes DNA and RNA.		
76. Photosynthesis	A process that occurs in plants that makes sugar (glucose) and oxygen from carbon dioxide, water, and sunlight. $6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$		
77. Glucose	The basic sugar that is broken down in cells for energy. Made in photosynthesis, broken down in respiration.		
78. ATP	Adenosine Triphosphate – a compound that has energy in an accessible form for cells.		
79. Cellular Respiration	A series of chemical reactions that occurs in all cells – breaking down glucose to make ATP. $\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O}$		
80. Enzyme	A protein that speeds up chemical reactions in cells		
81. Miller-Urey experiment	An experiment that showed that simple organic molecules could form in the primordial conditions on Earth.		
82. Amino Acid	The building blocks of proteins – these all have the same basic structure with different “R” groups.		
83. Monosaccharide	The building blocks of carbohydrates – a simple sugar.		

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84. Polymer	A long chain composed of repeating chemical subunits – includes proteins, DNA, starch, etc.		
85. Endocrine System	An organ system that produces hormones, sending signals around the body.		
86. Nervous system	An organ system that consists of the brain, spinal cord, and nerve cells. Controls thought, movement, and memory.		
87. Digestive system	An organ system that breaks down food and releases nutrients into the circulatory system		
88. Circulatory system	An organ system that consists of the heart and blood vessels – transports nutrients, oxygen, and wastes through the body.		
89. Respiratory system	An organ system that exchanges carbon dioxide and oxygen in the lungs through breathing.		
90. Integumentary system	An organ system that provides a protective barrier around the body – skin and mucus membranes		
91. Immune system	An organ system that fights invaders or diseases		
92. Reproductive system	An organ system that produces eggs and sperm and functions for reproduction		
93. Muscular system	An organ system that controls movement and provides structure to the body		
94. Xylem	A set of tissues in plants that transports water (mostly tubes in the stem and roots)		
95. Phloem	A set of tissues in plants that transports nutrients, especially glucose		

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96. Tropism	Growth of a plant in a particular direction due to environmental factors (like phototropism – growth towards light)		
97. Biosphere	The entire portion of the earth that supports life – organisms and their surroundings		
98. Biome	A type of community that supports diverse types of life adapted to their environment (rainforest, tundra, desert, etc)		
99. Ecosystem	A system that includes a particular community of organisms along with their surrounding environment.		
100. Community	A group of interdependent organisms of different species that live near each other and interact in a particular area.		
101. Population	A group of organisms of the same species in a particular area.		
102. Organism	A living thing – may be as simple as a single-celled bacteria or as complex as animals		
103. Organ system	A group of organs in the body that work together to perform a task (such as digestion – the digestive system)		
104. Organ	A body part that consists of different tissues combining to perform a particular task		
105. Tissue	A group of similar cells that have similar functions working together in an organism		
106. Cell	The smallest unit of living things that is still considered living – has a cell membrane and (often) other organelles.		
107. Organelle	A part of a cell that performs a specific function (like energy conversions in mitochondria)		

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108. Molecule	A group of 2 or more atoms bonded together covalently		
109. Atom	The building blocks of molecules and matter – has a certain number of protons, neutrons, and electrons		
110. Positive Feedback	A “snowball effect” process in biology – the more it happens, the more it increases		
111. Negative Feedback	A process in biology that is regulated such that it slows down when it has happened too much.		
112. Carrying capacity	A limit to how many organisms can be supported by their environment.		
113. Microorganisms	Living things that are so small that they cannot be seen without a microscope		
114. Ecological succession	The process of change that occurs as an ecosystem initially forms, or after an ecosystem is disrupted.		
115. Species	A group of similar organisms – must be able to reproduce and form fertile offspring.		
116. Primary succession	A type of ecological succession that occurs when organisms develop in an area that has never been inhabited		
117. Secondary succession	A type of ecological succession that occurs in an area where topsoil already exists and organisms have lived before.		
118. Climax community	The group of organisms that exists in an area when ecological succession has reached a stable balance.		
119. Predation	An interaction among organisms in which one organism hunts and eats another.		

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120. Parasitism	An interaction among organisms in which one benefits while the other is harmed		
121. Commensalism	An interaction among organisms in which one benefits while the other is unaffected		
122. Mutualism	An interaction among organisms in which both organisms benefit.		
123. Competition	An interaction among organisms in which they compete for limited resources like food, space, or light		
124. Variation	A difference among organisms of the same species in a population, like size or coloring		
125. Trophic levels	“Levels” in a food chain – producers, primary consumers, secondary consumers, etc.		
126. Food chain	A sequence of organisms that shows a single, direct path of organisms consuming each other.		
127. Food web	A “web” of organisms that shows all the predatory relationships; unlike a food chain, it shows all the organisms that eat each.		
128. Ecological pyramid	A triangle-shaped diagram with producers at the bottom and consumers above. The size of the various sections represents the energy and biomass for each trophic level.		
129. Producer	An organism that makes its own food – usually plants.		
130. Consumer	An organism that gets its nutrients by consuming other organisms – includes animals.		

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131. Autotroph	Synonym for producer – an organism that makes its own food		
132. Heterotroph	Synonym for consumer – an organism that eats other organisms to get nutrients.		
133. Herbivore	An animal or other organism that only eats plants – also known as a primary consumer		
134. Carnivore	An animal that only eats the meat from other animals – also known as a secondary or tertiary consumer.		
135. Omnivore	An animal that eats both plants and other animals		
136. Biomass	The total mass of all the organisms on a trophic level of an ecological pyramid – the greatest biomass is in the producers at the bottom.		
137. Energy	The ability to do work – all living things need energy to survive, and only 10% of the energy on each trophic level transfers up to the next level.		
138. Carbon Cycle	A cycle that shows how carbon moves through the biosphere – includes food chains, photosynthesis, fossil fuels, etc		
139. Nitrogen Cycle	A cycle that shows how nitrogen moves through the biosphere – includes nitrogen fixation and various reactions in the soil.		
140. Nitrogen fixation	A process done by bacteria in the soil – turning atmospheric nitrogen into nitrates and nitrites that are essential to all living organisms.		
141. Decomposition	A process done by bacteria and fungi – digesting the remains of dead organisms so that their nutrients can be recycled in an ecosystem		

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142. Ecosystem stability	The ability of an ecosystem to survive and maintain a balance among the organisms. Can be disrupted by events like wildfires, droughts, and floods.		
143. Vacuole	An organelle in cells that stores water, nutrients, and minerals. Important in plant cells to maintain homeostasis by osmosis.		
144. Chloroplast	An organelle found in plant cells that does photosynthesis		
145. Mitochondria	An organelle found in plant, animal, and other eukaryotic cells that is responsible for energy conversions.		
146. Cell membrane	A semipermeable membrane that only allows certain substances to pass in and out of a cell – the barrier between a cell and its external environment.		
147. Nucleus (of a cell)	An organelle found in all eukaryotic cells that holds the DNA and controls the activities of the cell		
148. Endoplasmic Reticulum	An organelle found in many eukaryotic cells that transports molecules around the cell. Often has ribosomes on it to do protein synthesis.		
149. Ribosome	An organelle present in all cells that does protein synthesis (translation of mRNA to make protein).		