**Essential Vocabulary for Biology STAAR**

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 membrane-bound organelles 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

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

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

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 at least one dominant allele

39. Recessive -A type of trait that is only shown when all/both 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

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)

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.

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. 6CO2+ 6H2O. C6H12O6 + 6O2

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. C6H12O6 + 6O2 . 6CO2 + 6H2O

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.

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

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)

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.

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.

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

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).