

8<sup>th</sup> Grade Science EOG Study Guide

Name: Ms. Smith

Due: Answer Key

Complete the following on the dates assigned: Wednesday 5/15 (#1-11), Thursday 5/16 (#12-37), Friday 5/17 (#38-57), Monday 5/20 (#58-76), Tuesday 5/21 (#77-110), Wednesday 5/22 (Shad Post-Survey + Released Online Science EOG), Thursday 5/23 (#111-145), Friday 5/24 (#146-155), Monday 5/27 (Memorial Day – No School), Tuesday 5/28 (overall homework assignment).

Properties of Matter

1. Define the following:

a. matter –

anything that has mass and takes up space

b. element –

a pure substance that cannot be broken down into other substances by chemical or physical means

c. freezing point –

the temperature at which a substance changes from a liquid to a solid

d. melting point –

the temperature at which a substance changes from a solid to a liquid

e. condensation point –

the temperature at which a substance changes from a gas to a liquid

f. boiling point –

the temperature at which a substance changes from a liquid to a gas

g. volume –

the amount of space an object takes up

h. mass –

a measure of how much matter is in an object

i. compound –

a pure substance made of two or more elements chemically combined

j. density –

the mass of a substance contained in a unit of volume

k. homogeneous mixture –

a mixture in which substances are evenly distributed throughout the mixture

l. heterogeneous mixture –

a mixture in which pure substances are unevenly distributed throughout the mixture

m. solubility –

a measure of how much solute can dissolve in a given solvent at a given temperature

n. solute –

the part of a solution present in a lesser amount and dissolved by the solvent

o. solvent –

a substance that dissolves another substance

p. atom –

the basic particle from which all elements are made

2. What is the formula for density?

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

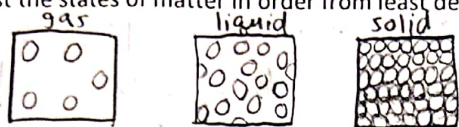
3. How do you calculate the volume of a regular object?

$$\text{Volume} = \text{Length} \times \text{Width} \times \text{Height}$$

4. How do you calculate the volume of an irregular object?

Water displacement → immerse the object in water, then subtract the volume of the water alone from the volume of the water plus the object

5. List the states of matter in order from least dense to most dense. Draw pictures.

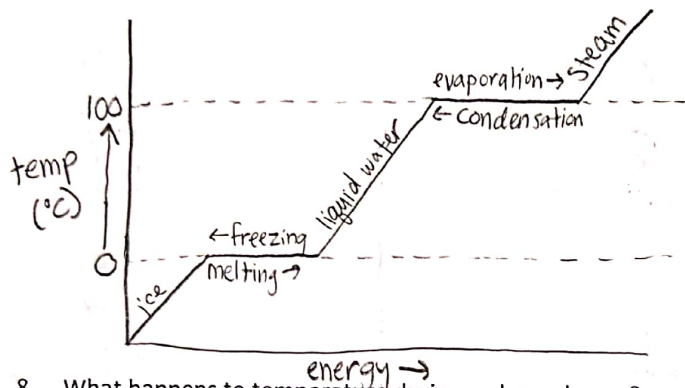


least dense → most dense

6. The density of Miss Kelly's necklace is  $25 \text{ g/cm}^3$ . Its mass is  $100 \text{ g}$ . What is the volume of the necklace?

$$d = \frac{m}{V} \quad 25 \text{ g/cm}^3 = \frac{100 \text{ g}}{? \text{ cm}^3} \quad V = 4 \text{ cm}^3$$

7. Draw and label the phase change graph for water.



8. What happens to temperature during a phase change?

temperature remains constant during a phase change

9. What is the density of water? How do you know if something will float or sink in water?

The density of water is  $1.0 \text{ g/mL}$  or  $1.0 \text{ g/cm}^3$ . An object with a density greater than  $1.0 \text{ g/cm}^3$  will sink in water and an object with a density less than  $1.0 \text{ g/cm}^3$  will float in water.

10. Is water an element, compound, or mixture?

Water is a compound

11. Which state of matter has a definite shape and volume?

A solid has a definite shape and volume.

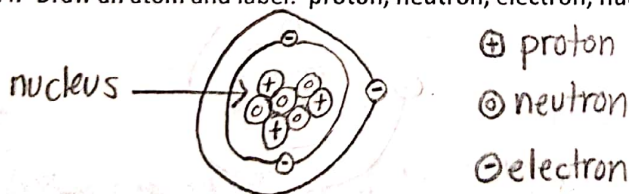
### Atoms/Periodic Table/Chemical Reactions/Acids and Bases

12. An atom of boron with 5 protons, 5 electrons, and 6 neutrons would have an atomic mass of 11 amu.

13. What is the central region of the atom called?

The central region of the atom is called the nucleus

14. Draw an atom and label: proton, neutron, electron, nucleus



15. List the 3 subatomic particles, their location in the atom, their mass, and their charge.

Proton: located in nucleus, mass = 1 amu, charge = positive (+)

Neutron: located in nucleus, mass = 1 amu, charge = neutral (0)

Electron: located in shells or orbitals surrounding nucleus, mass = 0 amu, charge = negative (-)

16. What are valence electrons?

Valence electrons are electrons in an atom's outermost valence shell and they determine the atom's bonding behavior (groups/columns)



17. What is an ion?

An ion is an atom or molecule with a net charge due to the loss (cation, +) or gain (anion, -) of one or more electrons

18. What is an isotope?

An isotope is an atom with the same number of protons and a different number of neutrons from other atoms of the same element

19. Use your periodic table to find the following information about Nitrogen, Carbon, Hydrogen, and Chlorine: number of protons, electrons, neutrons, valence electrons, atomic number, atomic mass.

	<u>Nitrogen</u>	<u>Carbon</u>	<u>Hydrogen</u>	<u>Chlorine</u>
# of protons	7	6	1	17
# of electrons	7	6	1	17
# of neutrons	7	6	0	18
# of valence electrons	5	4	1	7
Atomic number	7	6	1	17
Atomic mass	14	12	1	35

20. List the families on the periodic table.

Alkali Metals, Alkaline Earth Metals, Transition Metals, Boron Family, Carbon Family, Nitrogen Family, Oxygen Family, Halogens, Noble Gases, Rare Earth Metals (Lanthanide Series and Actinide Series)

21. Name the family that...

a. tends to lose 1 electron and become a positive ion?

Alkali Metals

b. tends to give away 2 electrons when forming compounds?

Alkali Earth Metals

c. can give away 4 electrons or steal 4 electrons?

Carbon Family

d. most reactive metals?

Alkali Metals

e. most reactive nonmetals?

Halogens

f. does not react with other elements?

Noble Gases

g. forms -3 ions in compounds?

Nitrogen Family

22. Where are the metals on the periodic table? Nonmetals? Metalloids?

Metals → left, center, bottom  
Nonmetals → top right + far right  
Metalloids → "staircase" between metals + nonmetals

23. How do you find the number of valence electrons?

# of valence electrons = main group # OR draw Bohr model for atom with maximum 2 valence  $e^-$  in first shell, and 8 valence  $e^-$  in second/third shells. Then, count outer shell  $e^-$ s.

24. What is the difference between a homogeneous and heterogeneous mixture?

A homogeneous mixture has the same uniform appearance and composition throughout, i.e. a solution. A heterogeneous mixture consists of visibly different substances or phases.

25. What is the difference between mass and weight?

Mass is a measure of how much matter is in an object. To find, use a balance. Mass does not change based on gravity. Weight is a measure of the force of gravity acting on an object.

26. List 3 physical properties that can be used to identify substances.

Hardness, texture, color, freezing point, state of matter, solubility, conductivity, etc.

27. List the 4 indicators of a chemical change.

Emission of heat or light, formation of a precipitate, evolution of a gas (bubbles), color change, noticeable odor change

28. What is a physical change? List 4 examples.

A physical change is any change that alters the form or appearance of matter but does not make any substance in the matter into a different substance. Examples: crushing a can, melting an ice cube, breaking glass, dissolving sugar in water

29. What is a chemical change? List 4 examples.

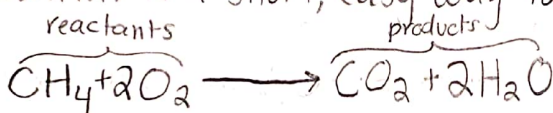
A chemical change is a change in matter that produces one or more new substances. Examples: baking a cake, a nail rusting, burning wood, mixing vinegar and baking soda (bubbles produced)

30. What type of change is a change in state of matter?

physical change

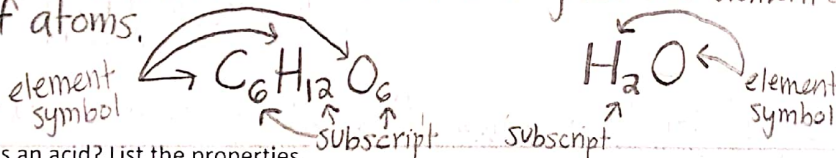
31. What is a chemical equation? Write a chemical equation and label the reactants and products.

A chemical equation is a short, easy way to show a chemical reaction, using symbols.



32. What is a chemical formula? List 2 examples of chemical formulas and label the element symbol and subscript.

A chemical formula is a formula that gives the elements in a compound and the ratio of atoms.



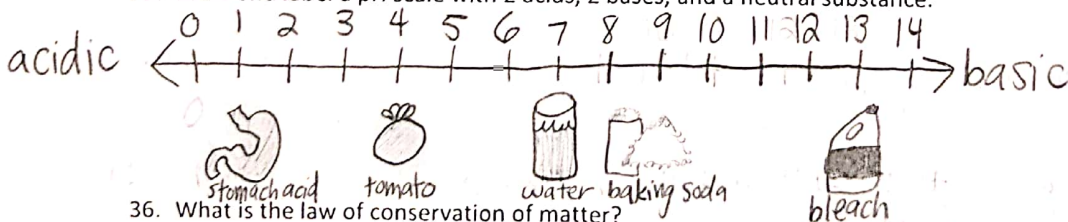
33. What is an acid? List the properties.

An acid is a substance that tastes sour, reacts with metals and carbonates, and turns blue litmus red.

34. What is a base? List the properties.

A base is a substance that tastes bitter, feels slippery, and turns red litmus paper blue.

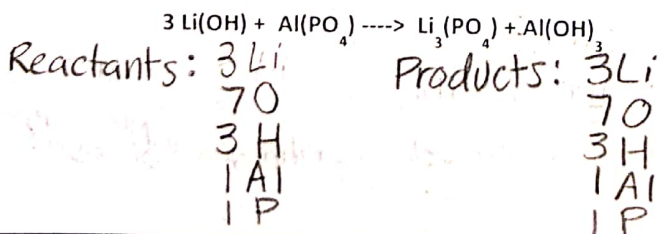
35. Draw and label a pH scale with 2 acids, 2 bases, and a neutral substance.



36. What is the law of conservation of matter?

Matter is not created or destroyed during a chemical reaction

37. Count the atoms. Is mass conserved?



yes, mass is conserved



## Energy

38. Compare and contrast plant and animal cells.

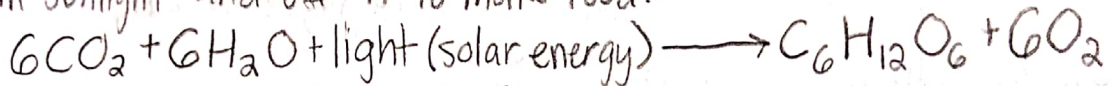
Both are eukaryotic (have membrane-bound organelles). Plant cells have chloroplasts, cell walls, and vacuoles that animal cells don't have. Both perform cellular respiration, but only plant cells photosynthesize.

39. Why do cells have organelles?

Cells have organelles because each organelle contributes in its own way to helping the cell function well as a whole.

40. What is photosynthesis? Write and label the BALANCED chemical equation (reactants, products, etc.)

Photosynthesis is the process by which plants and some other organisms capture the energy in sunlight and use it to make food.



41. Where do plants get the energy they need for photosynthesis?

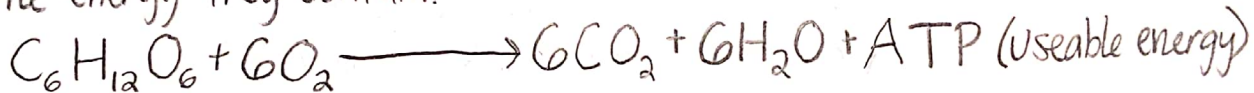
Energy from sunlight (solar energy)

42. What is the difference between eukaryotic and prokaryotic cells?

Eukaryotic cells have membrane bound organelles, defined nucleus, and are larger than prokaryotic cells. Prokaryotic cells do not perform mitosis or meiosis and are much more simple cells.

43. What is cellular respiration? Write and label the BALANCED chemical equation (reactants, products, etc.)

Cellular respiration is the process by which cells break down simple food molecules to release the energy they contain.



44. Where do animals get the energy they need for cellular respiration?

Energy from sunlight (solar energy) is stored in glucose by plants, then broken down to produce ATP (useable energy)

45. What is the location of the following organelles and what is their function?

- Cell membrane - located on the outside of a cell. Serves as border separating cell from other cells or substances in the environment.
- Cytoplasm - located inside the cell between the nucleus and the cell membrane. Its purpose is to contain all organelles and cell parts.
- Endoplasmic Reticulum - located throughout the cell, mainly near the nucleus and golgi apparatus. The ER's role in the cell is to synthesize and transport proteins.
- Golgi Apparatus - located very near the ER. The golgi apparatus' function is to process and bundle proteins and lipids.
- Ribosome - found "free" in the cytoplasm or bound to the ER. The function is to synthesize proteins.
- Vacuole - located in the central area of a cell. Vacuoles are essentially a storage space for the cell.
- Mitochondria - found in the cytoplasm, but the specific location depends on the type of cell. Serves as the "powerhouse" of the cell because it performs cellular respiration.
- Lysosome - located in the cytoplasm. Lysosomes contain digestive enzymes to digest excess or worn-out organelles.
- Nucleus - located in the central region of a cell. It serves to store the cell's genetic material and it coordinates the cell's activities.
- Cell Wall - this layer is located outside of the cell membrane. The cell wall provides strength and structure to the cell, as well as filters molecules that pass in/out of cell.
- Chloroplast - located in the cytoplasm of plant cells. Chloroplasts perform photosynthesis, working to convert light energy into sugars that can be used by cells.



46. By what 2 processes do cells divide?

Mitosis and Meiosis

47. What does energy balance mean?

Energy balance is the relationship between "energy in" (food calories taken into the body) and "energy out" (calories used by the body)

48. What is metabolism?

Metabolism is the chemical processes that occur within a living organism in order to maintain life.

49. What are proteins? What is their main function in the body?

Proteins are large, organic molecules made of carbon, hydrogen, oxygen, nitrogen, and sometimes sulfur. This macronutrient's main function is to act as a structural component of cells and tissues.

50. What can happen if you do not get enough calories?

A calorie deficit (eating less than your body needs to maintain itself) should result in weight loss.

51. What can happen if you get too many calories?

Eating too many calories and not burning enough of them off through activity can lead to weight gain

52. What is ATP?

ATP (Adenosine triphosphate) is able to store and transport chemical energy within cells. ATP is produced during cellular respiration by breaking down glucose.

53. What are amino acids?

ATP drives many cellular processes (i.e. muscle contraction, nerve impulse, etc.) Amino acids are the building blocks of protein. A large proportion of our cells, muscles, and tissue is made up of amino acids, so amino acids help give cells their structure.

54. What happens to molecules of food in both plants and animals?

Both plants and animals convert food molecules (glucose) into ATP, which is a useable energy source.

55. What is Basal Metabolic Rate? What does it tell you?

Basal Metabolic Rate is the rate at which the body uses energy while at rest to keep vital functions going (breathing, keeping warm, etc. This tells you the number of

56. What is a food web? calories needed to maintain weight.

A food web represents the feeding relationships in a habitat (interlocking food chains)

57. How does the law of conservation of mass relate to food webs and energy transfer through ecosystems?

The law of conservation of matter and energy states that matter and energy is neither created nor destroyed. In food webs and ecosystems, energy cycles through organisms and the environment.

58. What is microbiology?

the study of microscopic organisms (microbes)

59. What is a virus? List examples.

A virus is a small, non-living particle that invades and then reproduces inside a living cell. Examples include Epstein-Barr virus (mononucleosis) and Varicella

60. Are viruses living? Why or why not?

Viruses are considered non-living because they cannot reproduce without a host, do not consume energy, and cannot regulate temperature. Zoster virus (chicken pox)

61. How can viruses be treated?

For most viral infections, treatments can only help with symptoms while you wait for your immune system to fight off the virus.

62. What happens to the host cell after the virus uses it?

The host cell bursts and viruses are released



63. What are bacteria?

single-celled organisms that lack a nucleus

64. Describe the structure of bacteria (pro/eukaryotic? Living/nonliving?)

Bacteria are living and are prokaryotic. Bacteria have appendages, a cell envelope, and a cytoplasmic region containing DNA.

65. How are bacterial infections treated?

antibiotics

66. What are fungi?

eukaryotic organisms with cell walls, use spores to reproduce and are heterotrophs that feed by absorbing their food. Can be uni- or multicellular.

67. How do fungi help humans?

Fungi are part of the nutrient cycle in ecosystems, can be used as pesticides,

68. How do fungi harm humans?

used as antibiotics (penicillin), and can be eaten (mushrooms) can cause disease in both humans and the crops we eat. Examples of fungal infections are athlete's foot and yeast infections (yeast makes our bread rise)

69. What is a parasite?

an organism that lives on or in a host and causes harm to the host. Examples include worms, lice, and plasmodia.

70. Describe a parasitic relationship.

A parasitic relationship is one in which one organism, the parasite, lives off of another organism, the host, harming it and possibly causing death. An example is a flea biting a dog, sucking the blood, and causing the dog to itch.

71. Compare and contrast viruses and bacteria. How are they alike AND different?

Virus	Bacteria
• Not living	• Living
• Cannot be treated w/ meds	• Treated w/ antibiotics
• Very tiny	• Larger than virus
• Not a cell	• Prokaryotic cell

Both: cause disease, are microbes, have DNA

72. What type of cells are WE made up of?

There are about 200 different types of cells in the human body. Some examples are skin cells, blood cells, sex cells, nerve cells, B cells + T cells, muscle cells, and stem cells.

73. What is antibiotic resistance? How does this affect humans?

Antibiotic resistance is the ability of bacteria to withstand the effects of an antibiotic. This affects humans because those sick with bacterial infections are more likely to remain sick or die and new treatments could be costly or lengthy.

74. What is a pandemic?

a worldwide spread of a disease

75. What is an epidemic?

a widespread occurrence of an infectious disease in a community at a particular time. Affects a disproportionately large number of individuals in the population.

76. Define the following:

a. pathogen -

an organism that causes disease

b. vector -

any agent who carries and transmits an infectious pathogen into another living organism

c. antimicrobial -

an agent that kills microorganisms (microbes) or stops their growth

d. microbe -

Also called microorganisms. Include bacteria, protozoa, fungi, algae, amoebas, and slime molds. Many people think of microbes as simply the causes of disease, but every human is a host to billions of microbes that are essential to our life.



## Hydrosphere

77. What is polarity? Why is a water molecule polar? Which element gains electrons (is negative)? Which element loses electrons (is positive)?

A polar covalent compound is one in which there is a slight difference in electric charge between opposite sides of the molecule. A water molecule is polar because there is an uneven distribution of electron density. Water has a partial negative charge near the oxygen atom (gain electrons) and partial positive charges near the hydrogen atoms (loses electrons).

78. What is cohesion? Give an example.

water is attracted to water. Example: water beading up on a car

79. What is adhesion? Give an example.

water is attracted to other substances. Example: water drop stick to a blade of grass

80. What is surface tension? Give an example.

the tightness across the surface of water that is caused by the polar molecules pulling on one another. Example: paperclip "floating" in water

81. Why is water called the universal solvent?

Water dissolves so many substances that it is called the "universal solvent". It can dissolve solids (ex. sugar), liquids (ex. bleach), and gases (ex.  $O_2$  or  $CO_2$ ).

82. What percentage of the Earth is water? Freshwater? Salt water? Frozen freshwater?

71% of Earth is water → 3% of the Earth's water is freshwater  
↳ 79% of the Earth's freshwater is frozen  
97% of the Earth's water is saltwater

83. What are the 4 parts of the water cycle?

precipitation, evaporation, condensation, transpiration

84. What is transpiration?

the process by which plants give off water vapor through their leaves

85. What is run off?

water that flows over the ground surface rather than soaking into the ground

86. What is groundwater?

water that fills the cracks and spaces in underground soil and rock layers.

87. What is surface water?

water that collects on the surface of the ground. Ex. creeks, lakes, and streams

88. Where does the energy for the water cycle come from?

the water cycle is driven by the sun. Solar energy evaporates surface water.

89. Where does all water eventually flow?

the oceans

90. What is a divide?

a ridge of land that separates one watershed from another

91. What is an aquifer? What is necessary for an aquifer to form?

an underground layer of rock or soil that holds water. For an aquifer to form, rocks and materials in the ground must be permeable.



92. What does permeable mean? Impermeable? Give examples.

Permeable is a characteristic of a material that is full of tiny, connected air spaces that water can seep through. Example: gravel, sand  
Impermeable is a characteristic of materials through which water does not easily pass. Example: clay, granite.

93. What is porosity?

Porosity is a measure of the void spaces in a material (full of tiny holes). High porosity suggests that liquids could go right through.

94. What is lake turnover?

The process of a lake's water turning over from top to bottom. In summer, the surface is warm from the sun. In fall, the surface cools, becomes dense, and sinks. Layers "turn over."

95. What is eutrophication? What is the difference between natural and cultural eutrophication?

The process by which nutrients in a lake build up over time, causing an increase in the growth of algae. Natural eutrophication is a long, natural process which may take several decades or millennia to complete. Cultural eutrophication is caused by human beings (clearing land, building cities, land runoff)

96. Why is water unique?

as phosphates and nitrates are supplies to lakes and rivers.

Polarity, capillary action, surface tension, universal solvent, specific heat,

97. How do oceans affect weather and climate?

all 3 phases occur naturally on Earth, adhesion/cohesion  
Oceans absorb sunlight + distribute heat around the world. Ocean water is constantly evaporating, causing rain. Weather patterns are driven by ocean currents (coriolis effect)

98. Why does cold water sink to the bottom of the ocean and warm water rise to the top?

Example: El Niño  
Cold water is more dense than warm water (molecules slower, closer together)

99. What is an estuary? Why is it considered a nursery?

A coastal inlet or bay where fresh water from rivers mixes with salty ocean water. It is considered a nursery because so many marine animals reproduce and spend their early life there.

100. What is the largest estuary in NC?

Albemarle-Pamlico Estuary

101. Why are oysters and bacteria important to an estuary?

Oysters filter the water and their reef can be used as habitat (shelter/food) for other organisms in the estuary. Bacteria serve as decomposers in the estuary, supplying nutrients to marsh organisms.

102. What is upwelling? Why is it important?

The movement of cold water upward from the deep ocean that is caused by wind. Upwelling is important because it provides nutrients to the ecosystem near surface.

103. What are the MOST important photosynthesizers in the ocean?

Phytoplankton (diatoms) and algae → small, numerous, all across ocean

104. How does dissolved oxygen enter the ocean water?

Oxygen from the atmosphere dissolves and mixes into the water's surface. Also, algae and underwater grasses release oxygen during photosynthesis.

105. What natural resources are found in the ocean?

Fish, water, fuels, minerals

106. Why is shipping important?

Shipping allows for safe transportation of goods. Shipping is low-cost, efficient, and plays an important role in growth and sustainable development of countries.



107. What are hydrothermal vents? Where are they located? Why are they important?

Water is heated by hot rock magma beneath the ocean floor. As a result, hot water rises out of cracks in the ocean floor. These vents are located along ocean ridges, where the plates are moving apart. They are important

108. What are chemosynthetic organisms? What is chemosynthesis? Where are these organisms found?

Chemosynthesis is the process which uses chemical energy instead of light energy to produce food. Carbon molecules (such as  $CO_2$  or  $CH_4$ ) and nutrients are converted into organic matter.

for providing heat + minerals to bacteria and bottom-dwelling marine organisms.

Chemosynthetic organisms live in extreme conditions (bottom of ocean, boiling water temps) near ocean vents.

109. What is overfishing? Why is it a problem?

Depleting the number of fish from a body of water at a rate that the species cannot replenish. It is a problem because we are losing species, ecosystems, and food.

110. How do scientists use sonar to learn about the ocean?

SONAR is a system that uses sound waves to calculate the distance to an object, and that gets its name from "Sound Navigation and Ranging".

Populations and Ecosystems

111. What is an ecosystem? Give an example.

A biological community of interacting organisms and their physical environment. Examples: tropical rain forest, desert, marine, grassland, etc.

112. What is a community? Give an example.

An interacting group of various species in a common location. Example: forest with trees, animals, bacteria/fungi in soil, all interacting.

113. What is a population? Give an example.

A group of organisms of one species that interbreed and live in the same place at the same time. Example: 8 million people living in NYC.

114. How do scientists know an ecosystem is healthy?

Healthy ecosystems consist of native plants and animals interacting with each other and non-living things. There is an energy source (sun) for producers to grow and feed consumers. Decomposers are present. Ecosystems

115. What is a niche? Give an example.

The role or function of an organism or species in an ecosystem. Example: a lion hunting for zebra in a grassland.

116. What is population density?

A measure of the number of organisms that make up a population in a defined area.

117. What are limiting factors?

Factors within the environment which restrict maximum development, growth, or activity of a species. Examples: predators, food scarcity, disease, weather/natural disasters

118. How are density dependent limiting factors different from density independent limiting factors?

Density Dependent

\* increase their affect on a population as density ↑  
\* usually biotic

Density Independent

\* affect a population regardless of its density or size  
\* usually abiotic



119. What is competition?

The fight to obtain food, water, or shelter.

120. What is symbiosis?

Any type of a close and long-term biological interaction between two different biological organisms.

121. What is mutualism? Give an example.

The interaction between two or more species where each species benefits.

Example: Oxpecker bird living on zebra eating ticks off of zebra's skin.

122. What is parasitism? Give an example.

A relationship between species where one organism (parasite) lives on or in another organism (host), causing it harm. Example: heartworm in a dog's heart.

123. What is commensalism? Give an example.

A biological interaction in which one species gains benefits while the other species is neither benefited nor harmed. Example: barnacles attached to a whale.

124. Where does all the energy on earth come from?

The Sun

125. What is a producer? Give an example.

Organisms that can make their own energy through biochemical processes. Also called autotrophs. Example: fern

126. What is a consumer? Give an example.

An organism that feeds on plants or other animals for energy. There are four types: herbivores, carnivores, omnivores, and detritivores. Also called heterotrophs. Example: human

127. What is a carnivore? Give an example.

An organism that derives its energy from a diet consisting mainly or exclusively of animal tissue (via predation or scavenging). Example: lion

128. What is an herbivore? Give an example.

An animal that gets its energy from eating plants exclusively. Example: deer

129. What is an omnivore? Give an example.

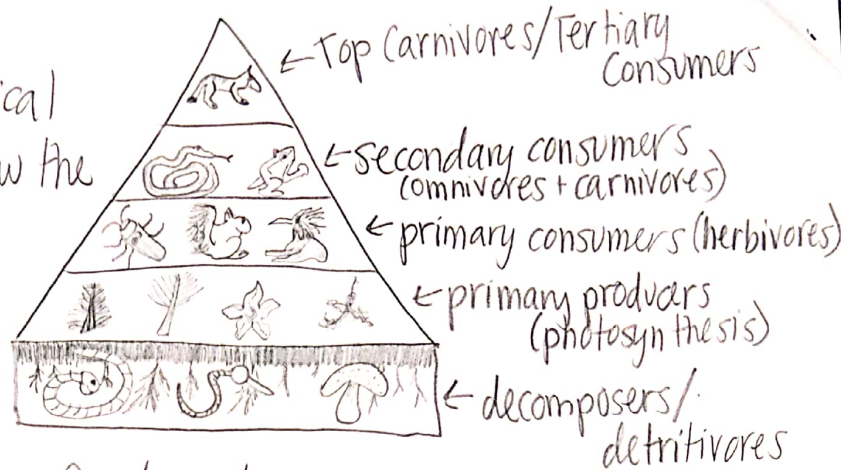
An animal that eats both plants and animals for their main food. Example: pig

130. What is biodiversity?

The variety of life on Earth, in all its forms and all its interactions, including genes, species, and ecosystems.

131. Draw an energy pyramid. What does it tell you?

An energy pyramid is a graphical representation designed to show the biomass or bio productivity at each trophic level in a given ecosystem. Example →



132. What is a trophic level?

Each step in a food chain or food web.

133. What percentage of energy is transferred from one trophic level to the next on an energy pyramid?

10% → the rest is lost largely through metabolic processes as heat

134. What is a primary consumer?

An organism that feeds on primary producers. Make up the second trophic level and are consumed by secondary consumers.

135. What is a decomposer? Give an example.

An organism that breaks down large chemicals from dead organisms into small chemicals and returns important materials to the soil and water.

136. Which trophic level stores the greatest amount of energy?

Primary producers (bottom)

Examples: bacteria, fungi, some insects + snails

137. Which trophic level stores the least amount of energy?

Top predators/consumers

138. What is a predator/Prey relationship?

The interactions between two species where one species is the hunted food source (prey) for the other (predator).

139. What is a number pyramid? What does it tell scientists?

A graphical representation that shows the number of organisms at each trophic level.

140. What is a biomass pyramid?

A graphical representation of biomass present in a unit area of various trophic levels.

141. What is biomass?

Organic material that comes from plants and animals, and it is a renewable source of energy.

142. List 3 biotic factors.

insects, food, disease, flowers, predators

143. List 3 abiotic factors.

pH, wind, water, temperature, sunlight



144. Describe the carbon cycle.

The process in which carbon travels from the atmosphere into organisms and the Earth and then back into the atmosphere. Includes photosynthesis, decay, fossil fuels, waste products, animal respiration, ocean uptake, etc.

145. Describe the oxygen cycle.

The process by which oxygen is released into the atmosphere by photosynthetic organisms and is taken up by aerobic organisms. Includes both plants and animals in the hydrosphere, lithosphere, biosphere, and atmosphere.

### Biotechnology

146. A microbial is a substance that kills microbes in order to prevent the spread of disease?

147. How does biotechnology affect agriculture?

Biotechnology enhances our ability to make improvements in crops and livestock. Example: genetically modify fruits to be cold-resistant.

148. How have we benefitted from biotechnology?

Help enhance air, water, and soil quality and overall sustainability

149. Technology is essential in science because...?

\* access to outer space and other remote locations \* measurement \* sample collection and treatment \* data collection and storage \* computation \* communication of information \*

150. The driving goal of biotechnology is to?

To develop or make products with specific uses and benefits to humans by genetically engineering natural resources.

151. List 5 examples of biotechnology products?

medications, plastics, sweeteners, fabrics, tires, bread, yogurt, etc.

152. What is the source of the most recent emerging field within biotechnology?

microbiology

153. List 5 Careers that biotechnology is involved with?

food scientist, epidemiologist, biochemist, soil and plant scientist, biomedical engineer, etc.

154. Name 3 industries that Biotechnology plays a significant role in?

healthcare (medical), crop production and agriculture, industrial uses of crops (plastics, biofuels), environmental uses

155. Name 5 areas of our lives that Biotechnology affects?

our food we eat, the air we breathe, medicine for our health, materials for our homes/clothes, and transportation 😊 DONE!