**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Directions**: Use the terms below to complete the passages. (Hint: Terms can be used multiple times.)

abiotic factors

atmosphere

autotrophs

biosphere

biotic factors

calcium carbonate

carbon

carbon dioxide

carnivores

coal

consumers

decompose

decomposition

detritus

ecology

ecosystem

electricity

energy

environments

first tropic

food chain(s)

food web

fossil fuels

gasoline

herbivores

heterotrophs

humans

natural gas

nutrients

omnivores

organic

organisms

oxygen

photosynthesis

predator

primary consumers

producers

quaternary consumer

respiration

second trophic

secondary consumers

soil

tertiary consumer

third trophic

Living organisms in our world are connected to other 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in a variety of ways. The branch of biology called 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the scientific study of interactions between organisms and their 3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, including relationships between living and nonliving things.

All living things on Earth can be found in the 4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the portion of Earth that supports life. It extends from high in the 5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the bottom of the oceans. Many different environments can be found in the biosphere. All living organisms found in an environment are called 6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Nonliving parts of an environment are called 7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. For example, whales, trees, and 8. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are biotic factors. Ocean currents, temperature, and 9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are abiotic factors.

The 10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ accounts for the flow of energy and the recycling of matter in an ecosystem, and one of the processes that unite communities within ecosystems. Organisms derive 11. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and nutrients through the dynamics of the food chain.

In general, plants are eaten by animals which are in turn eaten by other animals. Plants are 14. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which mean that they use 15. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to produce their own food. In the food chain, autotrophs are 16. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; they use the sun’s 17. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to produce carbohydrates, which are rich in energy. Organisms that produce their own food from sunlight represent the 18. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ level. In addition, plants absorb minerals from the 19. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to produce inorganic matter for use by other organisms.

Organisms that only eat plants occupy the 20. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ level. They are 21. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because they consume organic matter rather than produce it themselves, and are acting as 22. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because they consume plants. In this case, they are 23. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, because they are feeding directly on the autotrophs.

24. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are simplification of the relationships inherent in ecosystems because many different organisms feed on 25. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and consumers along the chain. In addition, a 26. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ may be both a herbivore and carnivore. The tangled mass of interconnections that evolves as a result of this is the 27. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. A food web includes the food sources and feeding relationships that exist in a particular 28. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Plants provide food for the 29. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, such as beef cattle. The cattle, in turn, are food for humans. In this chain, humans are acting as 30. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, since they eat meat. They are also secondary consumers in the food chain, and occupy the 31. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ level. Since humans can be both herbivores and carnivores, they are able to feed at several trophic levels; in other words, they are 32. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The animals that feed directly on the primary consumers are 33. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The secondary consumers provide food for 34. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, who in turn provide food for 35. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Picture this case scenario. A grasshopper that feeds on grass is a 36. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and is preyed on by a frog, the 37. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. A snake is a 38. \_\_\_\_\_\_\_\_\_\_\_\_\_\_, since it eats the frog, and a hawk is a 39. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, since it eats the snake. Each food chain ends with a top 40. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, an animal with no natural enemies (e.g. alligator, hawk, or polar bear).

In any food web, energy is lost each time one 41. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ eats another. Because of this, there have to be many more plants than there are plant-eaters. There are more autotrophs than 42. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and more plant-eaters than meat-eaters. Each level has about 43. \_\_\_\_\_% less energy available to it because some of the energy is lost as heat at each level.

44. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_flows from the sun into the biosphere, but 45. \_\_\_\_\_\_\_\_\_\_\_\_ do not enter the biosphere from an outside source. Essentially, the same pool of nutrients has circulated for the billions of years that the Earth has been in existence. Macronutrients (46. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, hydrogen, 47. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, nitrogen, and phosphorus) which are used by organisms in large quantities and micronutrients (iodine, iron, zinc, etc.) which are used only in trace quantities are all recycled. They are passed back and forth between living and nonliving components of the 48. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in processes known as biochemical cycles.

The atmosphere is the Earth’s major reservoir of carbon, in the form of 49. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Carbon enters the biotic part of the ecosystem through 50. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Plants of the forest take in the 51. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and fix it in organic compounds such as glucose, starch, cellulose, and other carbohydrates. 52. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in plants returns carbon dioxide back into the atmosphere. In addition, in the course of plant consumption, carbon passes into primary consumers, animals. When animal consumption occurs, or when the primary consumer is eaten, carbon passes to a 53. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, such as a lion that eats a zebra. 54. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ takes place in the cells of the primary and secondary consumers. And carbon is released back into environment as 55. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

When the primary and secondary consumers die, their 56. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ matter enters the soil through the process of 57. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It is broken down by the decomposers, or 58. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ feeders, which are small animals or microorganisms that subsist on decaying matter such as fallen leaves, dead bodies, and animal waste. Earthworms, mites, centipedes, insects, and crustaceans are 59. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Throughout history, much carbon has been converted to 60. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. High pressure and temperatures transform carbon-containing organic matter into 61. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, oil and 62. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Fossil fuels are used by power plants to generate 63. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and automobiles are powered by 64. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The products of the combustion of 65. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ include carbon dioxide and other carbon compounds that enter the atmosphere. 66. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ also enters the environment from the burning of wood and plants that occur during forest fires.

A final aspect of the carbon cycle is exchange with oceans. Some 67. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from the air dissolves in oceans and combines with calcium to form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which is incorporated into the shells of mollusks, and other creatures. When these shells 68. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, they transform into limestone, which, over time, dissolves as it is exposed to water. 69. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is released from the limestone and may return to the atmosphere.