TN Biology I: Standard 2 – Interdependence *(Includes coverage of Ch. 13, 14 & 16 in textbook)*

Chapter 13: Principles of Ecology

- Ecology is the study of living things and their interactions within their environment.
- Nature can be organized into different levels (from smallest to biggest) –
  organism → population → community → ecosystem → biome
- Biotic factors = living things; abiotic factors = nonliving things
- Biodiversity is the variety of living things found in an ecosystem.
- Keystone species have a large effect on ecosystems.
- Producers/autotrophs vs. consumers/heterotrophs
- Chemo- vs. photosynthesis. Which types of organisms do which process?
- Food chains link species according to feeding relationships. They only show connections occurring from 1 producer to a chain of consumers.
- Consumers can be: herbivores, carnivores, omnivores, detritivores, or decomposers.
- Specialists feed on a small number of species; generalists feed on a large number of species.
- Trophic levels represent levels of nourishment in a food chain.
  producer → primary consumer → secondary consumer → tertiary consumer
- Food webs show complex networks of feeding relationships and are more realistic than food chains.
- Know the following cycles: hydrologic (water), oxygen, carbon, nitrogen, and phosphorous.
- Energy pyramid vs. biomass pyramid vs. pyramid of numbers – How are these similar / different?

Chapter 14: Interactions in Ecosystems

- A habitat consists of all of the abiotic and biotic factors found in an environment.
- A niche is an organism's role in its environment.
- Competitive exclusion states that when 2 species are competing for the same resource(s), 1 will be better suited and the other will be excluded (becoming extinct or finding a new niche).
- Ecological equivalents are species occupying similar niches that live in different geographical regions.
- Intraspecific competition vs. interspecific competition. Competition is not the same as predation!
- Be able to describe the following symbiotic relationships: mutualism (both benefit), commensalism (1 benefits, 1 is unaffected), and parasitism (1 benefits, 1 is harmed).
- Population density = the # of individuals found in a defined space.
- Population dispersion patterns indicate the way a population is spread out. These may be: clumped, uniform, or random.
- Identify and describe Type I, II, and III survivorship curves
- Immigration vs. emigration; births vs. deaths and how each affects population size.
- Exponential vs. logistic growth. Carrying capacity limits population size.
- Limiting factors limit population growth and may be either density-dependent or –independent
- Succession (primary vs. secondary) is the sequence of biotic changes that serve to either regenerate a damaged community or create a new community. Pioneer species (ex. lichen) play a part in primary succession only, never secondary succession.

Chapter 16: Human Impact on Ecosystems

- Renewable vs. nonrenewable resources
- An ecological footprint is the amount of land necessary to produce/maintain enough food, water, shelter, energy and waste to support 1 individual in a population.
- Pollution is due to contaminants (ex. particulates, chemicals, etc.) added to air, water, or soil.
- The greenhouse effect contributes to global warming.
- Indicator species provide signs that tell us about the quality of an ecosystem
- Biomagnification is the movement of a pollutant up a food chain. This means that pollutants have greater effects on secondary and tertiary consumers than on producers.
- Introduced species = invasive species
- Protection of an umbrella species often leads to the protection of many others in an ecosystem.