

Waynesville High School

Biology

Unit 4: Diversity and Interdependence of Life

Estimated Time: 4 weeks

Essential Understanding:

Students will understand...

- all organisms must interact with each other and their environment.
- the impact humans have had on organisms and the environment.
- how science is done including observing, questioning, hypothesizing, designing, analyzing data, and communicating and supporting conclusions.

Essential Questions:

- What impact do organisms have on each other and Earth?
- How do you determine the relationship between one organism and another?

Learning Goal:

Estimated time: 2weeks

1. Students will understand within an ecosystem energy flows and matter cycles.

Targets:

Students will be able to...

- explain energy flow is one way in an ecosystem.
- define trophic level and describe the different trophic levels that exist (producers and level of consumers and decomposers).
- describe why autotrophs are essential components of an ecosystem.
- describe how organisms transform energy and matter.
- explain how the removal of one species can affect the energy transfer in the entire ecosystem.
- use hands-on-materials to explain biomagnification

Learning Goal:**Estimated time: 2 weeks**

2. Students will understand how populations increase and decrease due to environmental factors.

Targets:

Students will be able to...

- define ecological niche, population density, dispersion, density-dependent factors, density-independent factors.
- compare abiotic and biotic factors.
- describe primary and secondary succession.
- define carrying capacity, limiting factor.
- compare and contrast basic logistical and exponential growth models.
- recognize undisturbed ecosystems tend to have cyclic fluctuations around a state of rough equilibrium. describe how organisms transform energy and matter.
- explain how the removal of one species can affect the energy transfer in the entire ecosystem.
- explain how materials such as carbon, nitrogen and water are cycled through the environment.
- create a visual model for the flow of energy through organisms in an ecosystem.
- analyze real time data to study population changes and growth in specific locations using technology.
- design and conduct a scientific investigations using simulation software that looks at the effects of competition, immigration, or emigration on an ecosystem.
- explain concepts of carrying capacity and homeostasis in biomes using algebraic knowledge and mathematical graphing.