

Name: _____

Date: _____

Nitrogen Cycle: From Poop to Plants

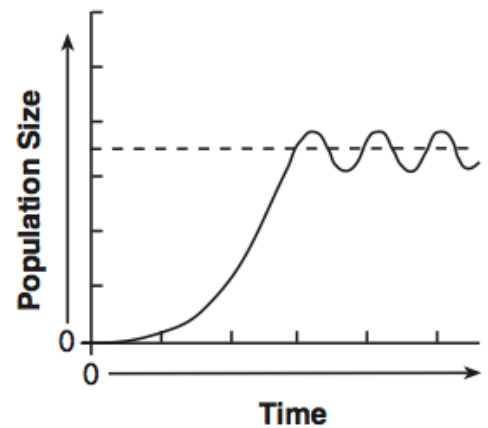
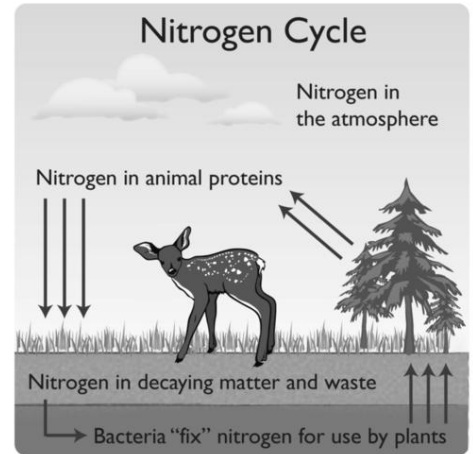
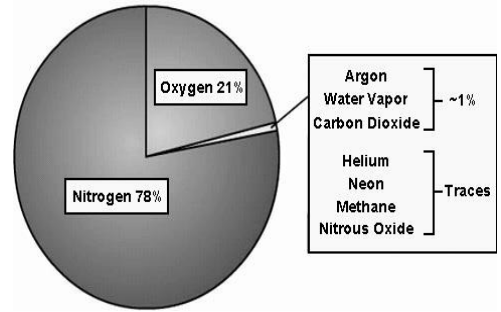
State the Problem: How does the element, nitrogen, cycle in an ecosystem?

Gather Information: Nitrogen is an element that is found in both the living portion (biotic) of our planet and the non-living (abiotic) parts of the Earth system. The nitrogen cycle, like the water cycle, is one of the biochemical cycles and is very important for ecosystems. Nitrogen moves slowly through the cycle and is stored in reservoirs such as the atmosphere, living organisms, soils, and oceans along its way. Most of the nitrogen on Earth is in the atmosphere. Approximately 80% of the molecules in Earth's atmosphere are made of two nitrogen atoms bonded together (N_2). All plants and animals need nitrogen to make amino acids, proteins and DNA, but the nitrogen in the atmosphere is not in a form that they can use. The molecules of nitrogen in the atmosphere can become usable for living things only when they are broken apart during lightning strikes or fires, by certain types of bacteria, or by bacteria in a symbiotic relationship with plant roots.

Similar to the amount of water and sunlight a plant gets, nitrogen is also a limiting factor. Animals get the nitrogen they need by consuming plants or other animals that contain organic molecules composed partially of nitrogen. When organisms die, their bodies decompose bringing the nitrogen into soil on land or into the oceans.

Certain actions of humans are causing changes to the nitrogen cycle and the amount of nitrogen that is stored in reservoirs. The use of nitrogen-rich fertilizers can cause increases in nitrogen to unhealthy levels in nearby streams and ponds. The increased nitrogen levels cause plants to grow more rapid than the ecosystem can support, causing an over shoot of the carrying capacity. This results in a dramatic die-off, having a large rapid impact on the ecosystem. The number of herbivores will increase well above the carrying capacity when the plant supply increases and then the herbivores are left without a food source when the plants die. In this way, changes in nutrient supply will affect the entire food web

It is important to learn the nitrogen cycle to be able to identify natural positive flow of nitrogen and therefore be able to potentially avoid the negative human impact.



Experimentation/Recording and Analyzing Data:

Procedure:

Select to start as either a living plant or animal. Circle either the live plant or live animal in your data table on the back side. Start at that location. Roll the die at the location and follow the instructions on the location sheet to determine where to move next. Read the reason provided at the station. Record where you are moving to as the next location and a quick reason for the move. After recording your end location and reason for the move, go to the end location and repeat the procedure. Start by recording that location as the start location.

Example:

Start Location (BLUE)	Reason for Move (GREEN)	Next Location (RED)

