

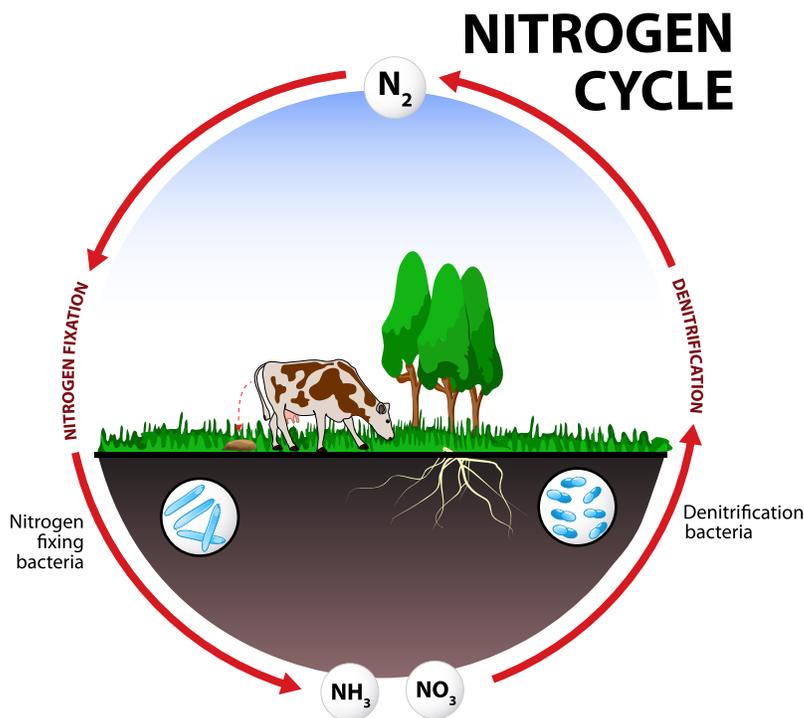
Sample Lesson #1

The Nitrogen Cycle

Nitrogen is a key element in the proteins that build our bodies. Protein molecules provide the structure for our muscles, as well as producing the enzymes that make our bodies work. Therefore, the nitrogen cycle is very important. The nitrogen cycle contains several key reservoirs, including the atmosphere, the soil, and the bodies of both plants and animals. There are several compound forms of nitrogen: nitrogen gas (N_2), ammonia (NH_3), and a class of compounds called nitrates.

The majority of the nitrogen in the world is nitrogen gas. However, this form of nitrogen can only be used by certain bacteria and fungi. If it weren't for these bacteria, nitrogen would be unavailable to the rest of living things. Luckily for us, through a process called **nitrogen fixation**, nitrogen is changed from its gaseous form into different forms that plants and animals can use. Here's how the nitrogen cycle works: Nitrogen gas, found in the atmosphere, is absorbed by bacteria which change this nitrogen into a usable form, usually ammonia or chemicals called nitrates. Plants then use this nitrogen to grow, and animals then receive nitrogen by eating the plants (or by eating other animals).

If only this part of the cycle occurred, the atmosphere would eventually run out of free nitrogen. However, there is a second part to the cycle. When animals and plants die, **decomposers** help to break down the dead matter and return the nutrients, including nitrogen in the form of ammonia or nitrates, to the soil. In the soil there are bacteria which convert this nitrogen back into the gas form and return it to the atmosphere. This is called **denitrification**.



1. Remember that a reservoir is a storage place in a nutrient cycle where the nutrient will remain for some time. List three reservoirs found in the nitrogen cycle.

2. The majority of the world's nitrogen is found in a (solid / liquid / gaseous) state.

3. If nitrogen from the atmosphere is continually being used, what keeps the atmosphere from running out of nitrogen?
- A) More nitrogen is made in the sun.
 - B) Extra nitrogen is stored in the clouds.
 - C) As dead organisms decompose, the nitrogen from their bodies is converted back into nitrogen gas.

4. True or False?

_____ Nitrogen fixation can only be performed by animals.

_____ The ocean is the largest reservoir in the water cycle.

6. For each of the activities listed, circle the kind of change that is taking place.

- | | | |
|------------------------|----------|----------|
| A) an ice cube melting | physical | chemical |
| B) a cake baking | physical | chemical |
| C) paper being cut | physical | chemical |

7. Which of the following is not true of blizzards?

- A) Strong winds move snow on the ground and falling snow.
- B) They occur because of differences in air pressure.
- C) They happen only in regions near the north pole.

8. Choose the correct term from the word bank to complete each sentence.

melting	condensation	transpiration
perspiration	ground	brown

Plants can be part of the water cycle through a process called _____.

Water located under the soil in cracks in the rocks is called _____ water.

Water changing from a solid state into a liquid state is called _____.

9. In the body, tissues organize themselves into groups called (organs / cells), which perform a special job in the body. An example is the heart.

10. Which of the following might be a decomposer?

horse beetle eagle