



High School Science Virtual Learning

**Applied Biological Science**

**Environmental Micro**

May 13, 2020



# High School Applied Biological Science

## Lesson: May 13, 2020

### **Objective/Learning Target:**

Recognize the role microbes play in maintaining the health of ecosystems including the major biogeochemical cycles.



## Let's Get Started:

1. What would happen if all microbes worldwide were eliminated? Watch this [video](#) to find out.
2. What effect would this have on you individually? The world?



## Let's Get Started: Answers

1. What would happen if all microbes worldwide were eliminated? Watch this [video](#) to find out.
2. What effect would this have on you individually? The world?
  - a. Human microbiome would be affected, starvation, etc.
  - b. plants/crops/animals would die as no nutrients are cycled, no decomposition, oxygen level plummets, etc.



## Lesson Activity:

Microbes are essential for not only our survival but that of the planet. Read about the role microbes play in the environment by visiting [this website](#) and summarize each of the 3 areas below:

- Carbon cycle
- Nitrogen cycle
- Food chain



## Lesson Activity: Answers

Microbes are essential for not only our survival but that of the planet. Read about the role microbes play in the environment by visiting [this website](#) and summarize each of the 3 areas below:

- Carbon cycle
  - Photosynthetic microbes take in carbon during photosynthesis and produce glucose, released through decomposition and respiration
- Nitrogen cycle
  - Nitrogen released by microbes, nitrogen fixation allows nitrogen to be used by plants
- Food chain
  - Decompose organisms, primary producers



# Practice Questions

1. What is nitrogen fixation and why is it important?
2. What process occurs for nitrogen to be released in the environment?
3. What is carbon fixation and why is it important?
4. What process do cyanobacteria use to fix carbon?
5. What would happen if you removed microbes from the environment?



## Practice Questions - Answers

1. What is nitrogen fixation and why is it important?
  - a. Gaseous nitrogen is reduced to ammonia for organisms to use
2. What process occurs for nitrogen to be released in the environment?
  - a. ammonification, nitrification and denitrification
3. What is carbon fixation and why is it important?
  - a. Turning inorganic carbon into organic molecules for organisms to use
4. What process do cyanobacteria use to fix carbon?
  - a. Photosynthesis
5. What would happen if you removed microbes from the environment?
  - a. Carbon and nitrogen cycles would collapse resulting in no plant growth, etc.



## Additional Practice

1. Check your understanding by creating a diagram of the carbon and nitrogen cycles emphasizing the role microbes play in cycling each nutrient.
2. For extra practice, work through and check your answers to this lesson from [NOAA](#) on the biogeochemical cycles.
3. Read more about how microbes can influence climate [here](#).