Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**The Nitrogen Cycle: Becoming a Virtual Farm Scientist**

Go to Mrs. Musto’s website (kmusto.weebly.com). Under Useful Links, click on the Virtual Farm Nitrogen Cycle button. This will take you to the following link:

<http://www.sites.ext.vt.edu/virtualfarm/flash_mov/nitrogencycleintro.swf>

Click on the farmer’s face.

Part 1: SLIDE SHOW

Answer the following questions for each slide:

**Slide 1**

1. Nitrogen makes up \_\_\_\_\_\_\_\_\_\_\_\_% of the air.
2. Can plants and animals get nitrogen directly from air?

**Slide 2**

1. **Atmosphere:** Name the 2 forms of nitrogen found in the atmosphere?
2. **Nitrate (NO3):** What is the name of the process during which nitrates in the soil are released into the atmosphere?
3. Name 3 ways that nitrogen can be returned to soil organic matter. (Hint: follow the arrows)
4. **Soil Organic Matter:** What does soil organic matter consist of?
5. **Symbiotic Fixation (Legumes):** Name 2 types of legume plants that can perform symbiotic [nitrogen] fixation?
6. **Nitrogen Fertilizer:** What is the type of nitrogen fertilizer produced through Industrial Fixation?
7. **Ammonium (NH4):**
8. What organisms are able to convert ammonium (NH4) to nitrate (NO3)?
9. **Plant uptake:** How does nitrogen get into the plant? What is the nitrogen used for?
10. **Leaching:** What is leaching?

**Slide 3**

What does plant protein allow the cattle to do?

**Slide 4**

What do farmers do with the cattle manure and urine?

**Slide 5**

When nitrogen leaves the farm, what needs to happen?

**Slide 6**

What happens if too much nitrogen enters into the water from run off or leaching?

**Application:**

Why is it important for farmers to understand the nitrogen cycle?

**Part 2: THE FARM**

Now click on the farm (the tractor trailer) and answer the following questions:

1. Where do animals get their nitrogen?
2. How does nitrogen leave the atmosphere?
3. What does fertilizer provide?
4. What is a manure lagoon?
5. Is nitrogen needed by plants and animals in the stream? Can there be too much nitrogen? Explain.
6. What does a pasture consist of? What is nitrogen fixation? What kind of organisms can ‘fix’ nitrogen? Where are they found?
7. How is nitrogen lost from the soil and therefore made unavailable to plants? (Hint: 4 ways)
8. Where do the crops (plants) get their nitrogen to grow?

Part 3: HELP THE FARMER MANAGE HIS FARM

#1 How much manure is made from 2 steer? \_\_\_\_\_\_\_\_\_\_\_ pounds.

#2 How much nitrogen in the manure is lost or unavailable? \_\_\_\_\_\_\_\_\_\_\_ pounds.

#3 How many pounds of nitrogen fertilizer is needed? \_\_\_\_\_\_\_\_\_\_\_\_\_ pounds.

#4 How much nitrogen is in the corn we harvest? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ pounds.

#5 How much nitrogen is gained by the 2 steers? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ pounds.

#6 How much feed containing nitrogen must the farmer purchase?

\_\_\_\_\_\_\_\_\_\_\_\_\_ pounds

CONGRATULATIONS! YOU ARE NOW A VIRTUAL FARM SCIENTIST!