

THE NITROGEN CYCLE  
**VOCABULARY**

**nitrogen:** An element in air and in protoplasm; a colorless, odorless, tasteless gaseous element that forms over 3/4 of the atmosphere and is a necessary part of all animal and vegetable tissues.

**nitrogen cycle:** The circulation of nitrogen and its compounds by living organisms in nature; nitrogen in the air passes into the soil where it is changed to nitrates by bacteria and used by green plants and then in turn by animals. Decaying plants and animals and animal waste products are in turn acted on by bacteria and the nitrogen in them is again made available for circulation.

**amino acids:** Any of a number of complex organic compounds that combine in various ways to form the proteins that make up living matter.

**atmosphere:** The layers of gases that surround the earth; the air.

**nitrogen fixing:** Combining of nitrogen with other elements to form biologically useful compounds.

**legumes:** any plant of the pea family which bears pods containing a number of seeds; can absorb nitrogen from the air and convert it into nitrates by means of bacteria present in nodules on the roots of the plants. (examples - clover, soybeans)

**compound:** Any substance consisting of two or more kinds of atoms (elements) chemically combined.

**nodules:** Small swellings on the roots of plants that contain nitrogen-fixing bacteria.

**bacteria:** A large group of one-celled microscopic plants concerned in the process of fermentation, nitrogen fixation, etc.

**denitrifying:** The process by which bacteria changes fixed nitrogen back to gaseous nitrogen, which is then released back into the environment.

**protoplasm:** A colorless, jellylike substance which makes up every living cell and is composed of four elements--carbon, oxygen, nitrogen, and hydrogen.

**fossil fuel:** Fuel, such as wood, coal, oil, burned to produce useful heat or power; fuels that are made of hardened remains or traces of animals or plants of a former geological age.

**acid rain:** Rainfall, or other precipitation, contaminated by high concentrations of sulfur dioxide and nitrogen oxides. Rain is considered acidic if its pH is less than 5.6.

THE NITROGEN CYCLE  
**VOCABULARY REVIEW**

**Directions:** Match the definition in the left column with the word it identifies from the column on the right.

- |  |                    |
|--|--------------------|
| 1. _____ The circulation of nitrogen and its compounds by living organisms in nature.  | A. acid rain       |
| 2. _____ One-celled microscopic plants used in the process of nitrogen fixation.   | B. atmosphere      |
| 3. _____ Substance which makes up living cells.  | C. protoplasm      |
| 4. _____ Two or more elements chemically combined.   | D. nitrogen cycle  |
| 5. _____ A gaseous element that forms about 3/4 of the atmosphere and is in animal and plant matter.                               | E. amino acids     |
| 6. _____ Process of reducing elements in the soil to gaseous nitrogen by bacteria.   | F. bacteria        |
| 7. _____ Any plant of the pea family which absorbs nitrogen from the air and, by means of bacteria, converts it to a useable form. | G. compound        |
| 8. _____ Complex organic compounds combined to form proteins that make up living matter.   | H. nitrogen        |
| 9. _____ Layers of gases that surround the earth; the air.   | I. denitrifying    |
| 10. _____ Made of hardened remains of once-living things.  | J. nodules         |
| 11. _____ Swellings on roots containing bacteria necessary for nitrogen-fixing.  | K. legumes         |
| 12. _____ Converting atmospheric nitrogen into nitrates, a useable form for plants.  | L. nitrogen-fixing |
| 13. _____ Contaminated rainfall.   | M. fossil fuel     |

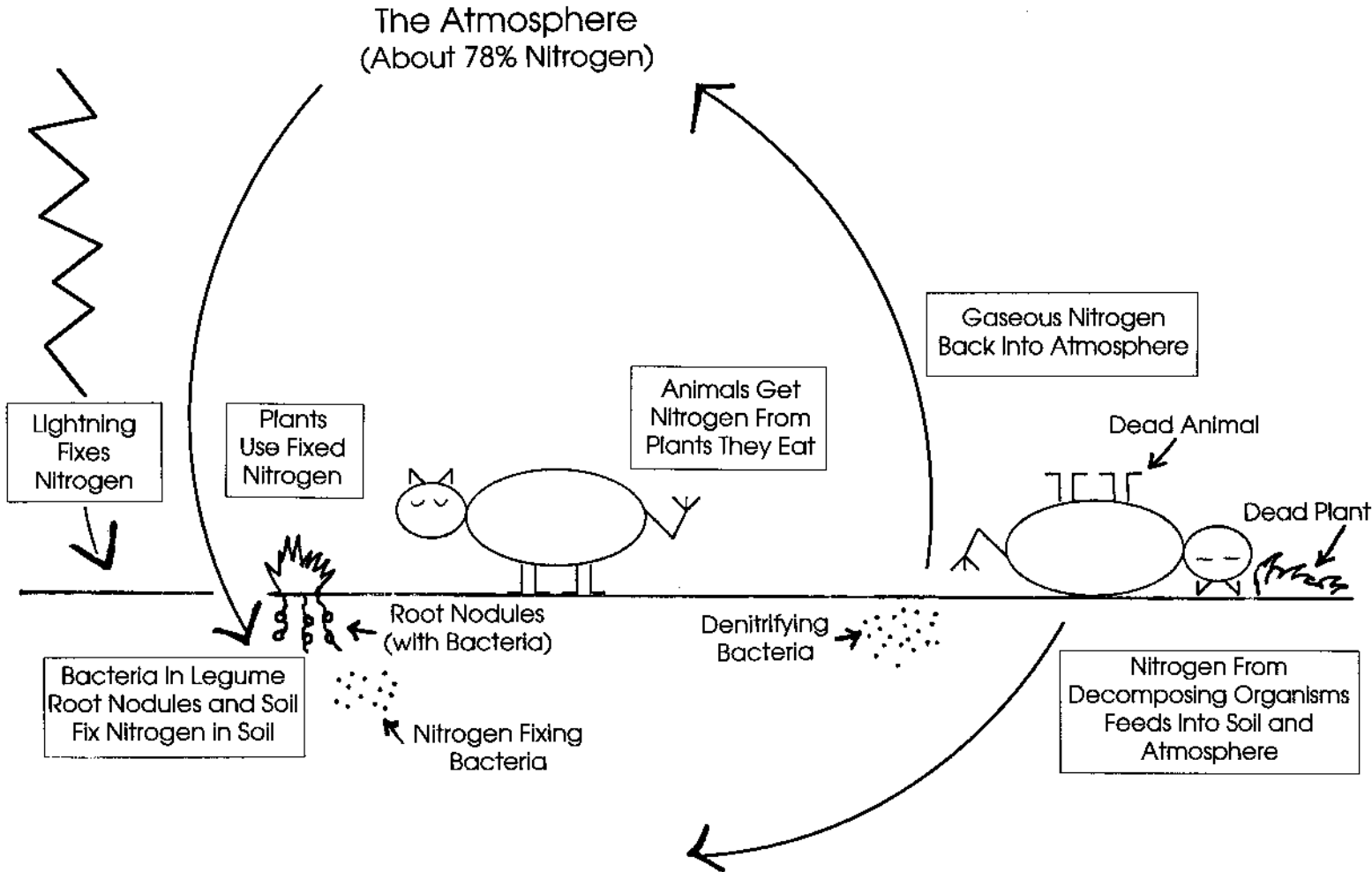


**THE NITROGEN CYCLE**  
**VIDEO INSTRUCTIONAL QUIZ**

**Directions:** Mark (✓) the boxes on your answer sheet either True or False, or fill in the blank (✎) when you hear the tone.

- T      F
1.   Nitrogen makes up about fifty percent of the air around us.
  2.   Both corn and soybeans are legumes.
  3.   Some of our waterways are being harmed by agricultural nitrogen pollution from manure and \_\_\_\_\_.
  4.   Most plants absorb the nitrogen they need from the soil or water in which they grow.
  5.   The nodules that grow on legumes' roots are home to symbiotic bacteria.
  6.   Meat-eaters get the nitrogen they need by eating animals that feed on \_\_\_\_\_.
  7.   Most of the nitrogen that plants use is fixed by lightning.
  8.   The nitrogen in vehicle exhausts and power plant emissions contributes to \_\_\_\_\_.
  9.   Most plants can only use nitrogen that has been combined with other elements, or \_\_\_\_\_.
  10.   When organisms rot, or decay, they free, or release, nitrogen atoms that can then be used by the next generation of living things.

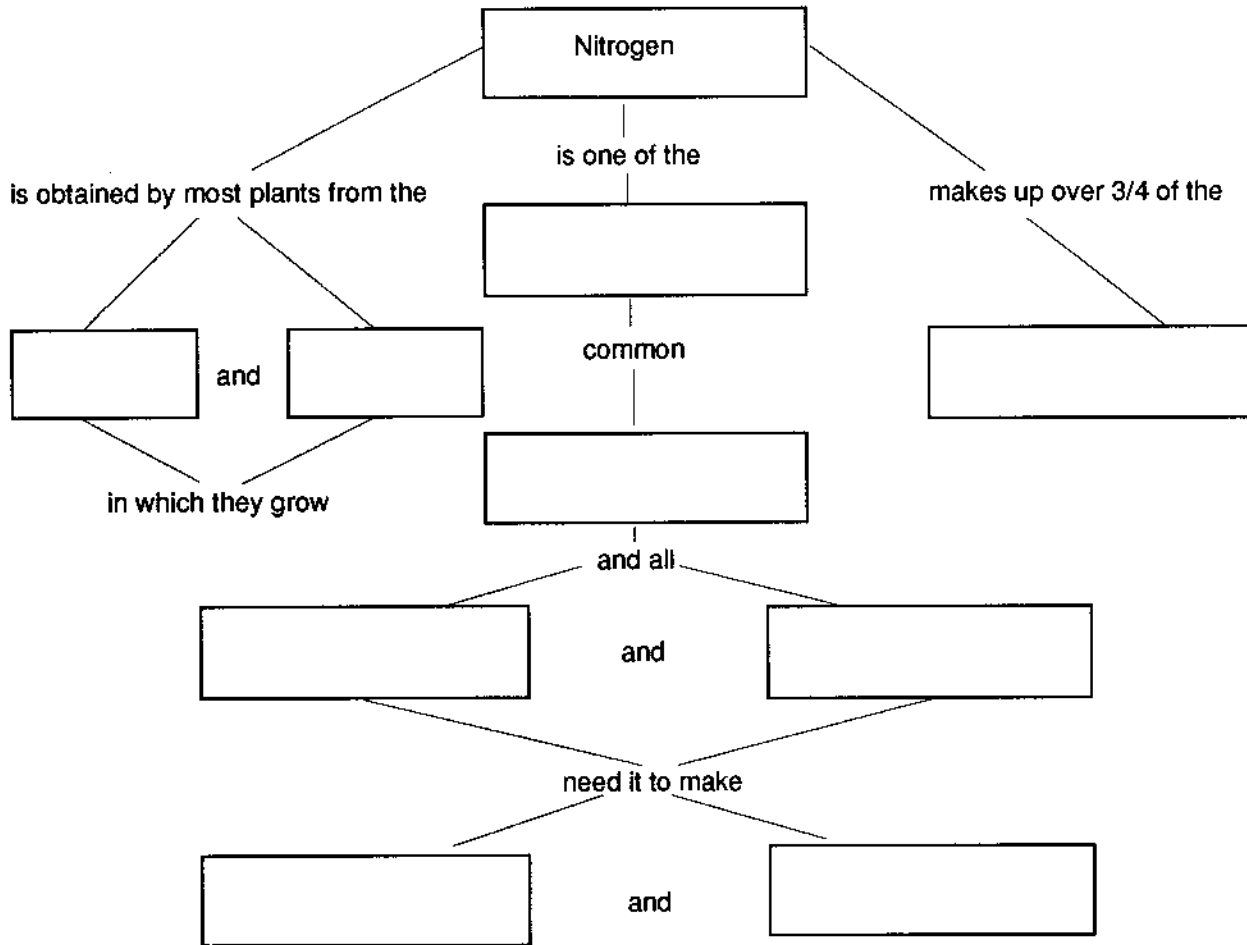
# THE NITROGEN CYCLE



THE NITROGEN CYCLE

CONCEPT MAP: ELEMENTS OF THE NITROGEN CYCLE

Fill in the boxes with the correct words from the list at the bottom of this page.



**Use these words**

- amino acids
- animals
- atmosphere
- elements
- most
- plants
- proteins
- soil
- water

**THE NITROGEN CYCLE**  
**FORMS OF NITROGEN**

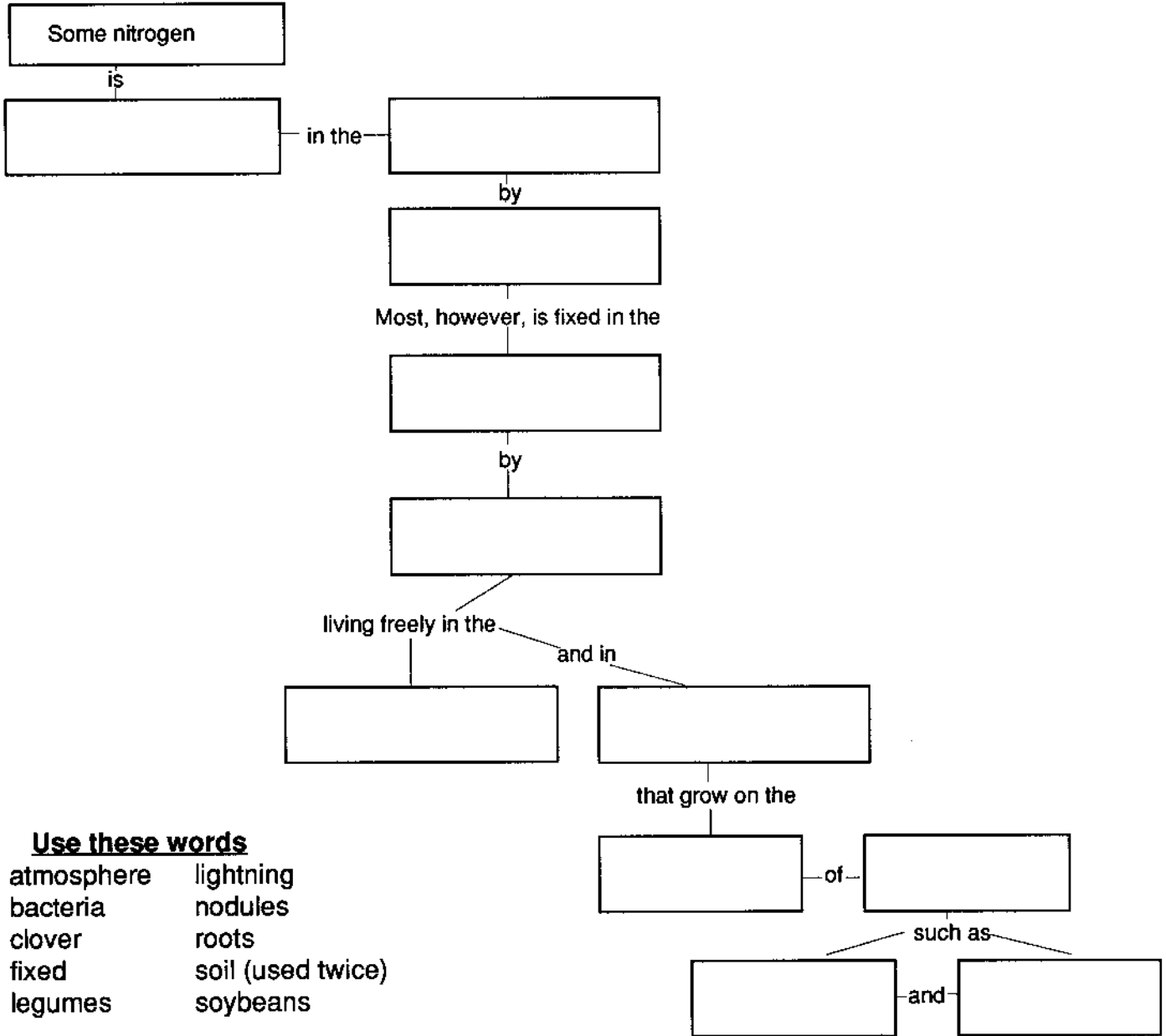
**Directions:** Read the sentences and fill (✓) in the blanks with the appropriate word from the list below.

(1) \_\_\_\_\_ in the (2) \_\_\_\_\_ is in a (3) \_\_\_\_\_ form. However, it is the (4) \_\_\_\_\_ kind of form for most (5) \_\_\_\_\_. They need nitrogen that has been (6) \_\_\_\_\_ or (7) \_\_\_\_\_ with other (8) \_\_\_\_\_ into (9) \_\_\_\_\_ useful (10) \_\_\_\_\_.

nitrogen      biologically      atmosphere      combined      compounds  
fixed      gas      organisms      wrong      elements

**CONCEPT MAP 2: HOW NITROGEN IS FIXED**

Fill in the boxes with the correct words from the list at the bottom of this page.



**Use these words**

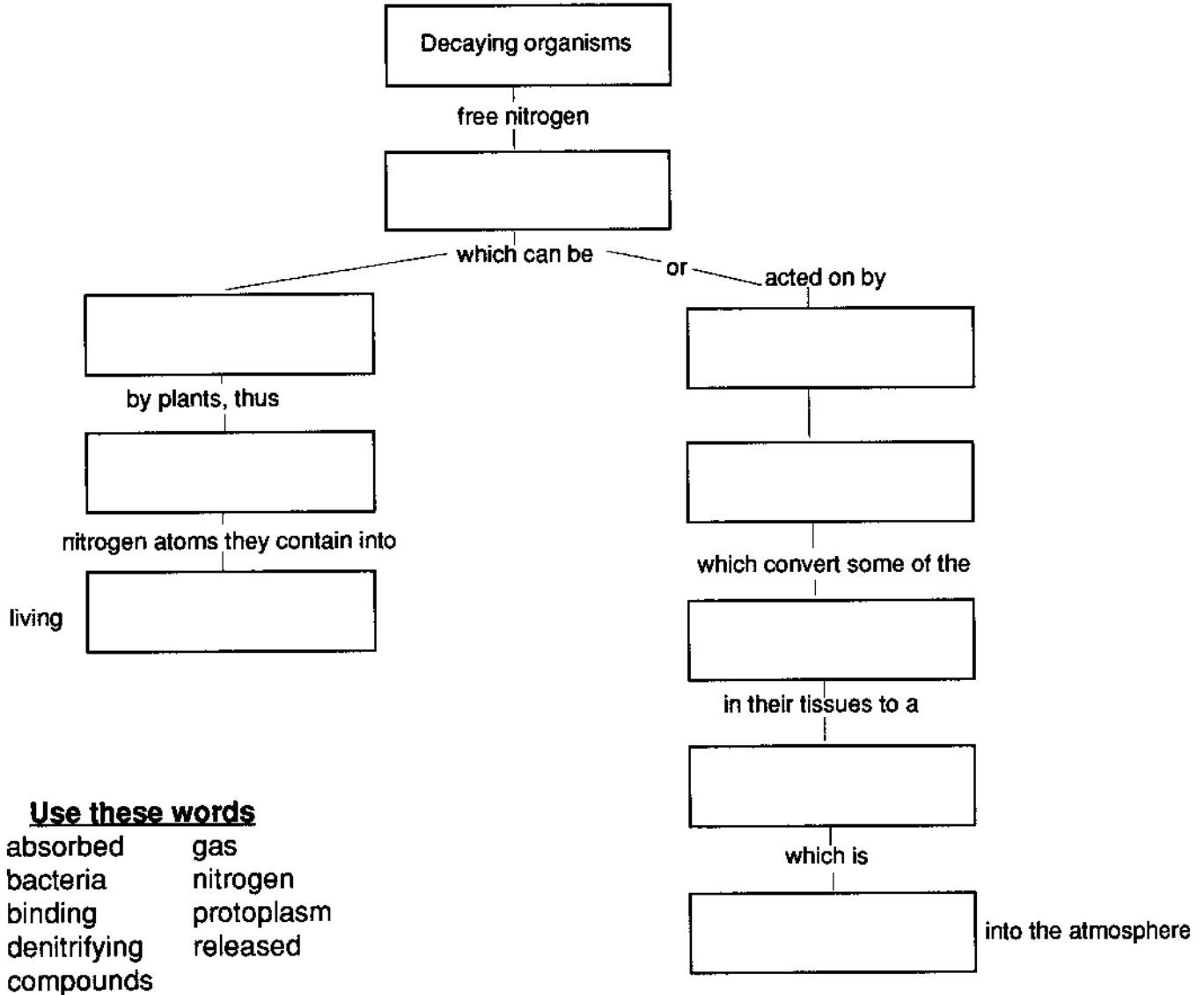
- |            |                   |
|------------|-------------------|
| atmosphere | lightning         |
| bacteria   | nodules           |
| clover     | roots             |
| fixed      | soil (used twice) |
| legumes    | soybeans          |



THE NITROGEN CYCLE

CONCEPT MAP 3: DECAYING ORGANISMS

Fill in the boxes with the correct words from the list at the bottom of this page.



**THE NITROGEN CYCLE**  
**NITROGEN: THE POLLUTER**

**Directions:** Read the sentence and fill (✍) in the blanks with the appropriate word from the list below.

Nitrogen-rich (1)\_\_\_\_\_ and animal (2)\_\_\_\_\_ have (3)\_\_\_\_\_ many (4)\_\_\_\_\_ as has acid (5)\_\_\_\_\_, largely produced by the (6)\_\_\_\_\_ in the (7)\_\_\_\_\_ from (8)\_\_\_\_\_ -generating plants and (9)\_\_\_\_\_ from (10)\_\_\_\_\_ vehicles.

nitrogen   electric   emissions   exhausts   fertilizers  
 fossil-fueled   manure   polluted   rain   waterways