

No.	Answer
1	The process of converting elemental nitrogen into compounds that can be used by living things
2	Nitrogen is contained in proteins, which are made from amino acids, and in nucleic acids such as DNA.
3	<p>a Convert nitrogen-containing ions to NO_3^-.</p> <p>b Convert NO_3^- ions back to elemental nitrogen, N_2.</p> <p>c They are involved in decomposition of organic matter, and produce ammonia.</p>
4	An example is the Haber process: $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightarrow 2\text{NH}_3(\text{g})$
5	Through the action of nitrogen-fixing bacteria found in the nodules of leguminous plants.
6	$n(\text{NO}_3^-) = \frac{m}{M} = \frac{0.500}{62.01} = 8.063 \times 10^{-3} \text{ mol}$ $n(\text{H}_2\text{NCH}_2\text{COOH}) = n(\text{NO}_3^-)$ $\therefore m(\text{H}_2\text{NCH}_2\text{COOH}) = n \times M = 8.063 \times 10^{-3} \times 75.07 = 0.605 \text{ g}$
7	$n(\text{NO}_3^-) = \frac{m}{M} = \frac{20.6}{62.01} = 0.3322 \text{ mol}$ $n(\text{N}_2) = \frac{1}{2} \times n(\text{NO}_3^-) = 0.1661 \text{ mol}$ $m(\text{N}_2) = n \times M = 0.1661 \times 28.02 = 4.65 \text{ g}$
8	$\text{NH}_3(\text{aq}) + \text{H}_2\text{O}(\text{l}) \rightleftharpoons \text{NH}_4^+(\text{aq}) + \text{OH}^-(\text{aq})$
9	$\text{H}_2\text{O}(\text{l}) + 2\text{NO}_2(\text{g}) \rightarrow \text{HNO}_2(\text{aq}) + \text{HNO}_3(\text{aq})$
10	An example is: $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{NO}(\text{g})$ (in the presence of lightning), $2\text{NO}(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{NO}_2(\text{g})$, reaction with water, then rained down as HNO_3 . NO_3^- ions are taken up by plants. The plants make amino acids and hence protein. The cow eats the plant. The cow breaks down the ingested protein and then the amino acids are used to make different types of protein in the cow.
11	It can result in highly damaging acid rain.
12	It stops biological fixation from occurring.
13	In order for farmers to keep up with the huge crop demand.
14	It is untreated urine and faeces. The urine is rich in nitrogenous wastes.
15	More acid rain. The death of ecosystems in waterways due to eutrophication.