Reference

Texts are meaningful communicative units of language. Meaning of texts is accomplished by formal links. It is important to identify these links in order to fully understand a text. The most frequent formal links present in academic texts are referring expressions, transitional devices and lexical chains.

Referring expressions are pronouns (he, it, those, which, etc.) that point to something mentioned in the text. Transitional devices are linking words (also, however, first, etc.) that connect ideas and provide unity to the text. Lexical chains refer to synonyms / near synonyms (power/energy), antonyms (renewable/non-renewable) and general words or phrases (global warming/climate change/temperature increase) that help create elegant repetition in a text.

Pre-tasks

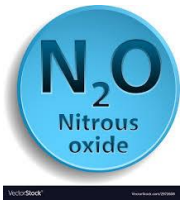
Nitrous oxide, a greenhouse gas, is on the rise

Circle the letter that corresponds to the best option to complete each exercise in sections 1 – 5

1. Predicting (5)

According to the cues provided, what is the text about?

a. N_2O is the third most important long-lived greenhouse gas.
b. We have learnt how to produce more food with less nitrous oxide emission.
c. Increasing use of nitrogen fertilizers is leading to higher N_2O levels in the atmosphere.
d. N_2O in the atmosphere has been found to decrease steadily since the mid-20th century.



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Nitrous oxide (N_2O) is the third most important long-lived greenhouse gas, after carbon dioxide and methane. Nitrous oxide is also one of the main stratospheric ozone depleting substances -- and we are releasing more of it into the atmosphere than previously thought. This conclusion was published in a new study this week in *Nature Climate Change*.

"We see that the N_2O emissions have increased considerably during the past two decades, but especially from 2009 onwards," said lead scientist Rona L. Thompson from NILU-Norwegian Institute for Air Research. "Our estimates show that the emission of N_2O has increased faster over the last decade than estimated by the Intergovernmental Panel on Climate Change (IPCC) emission factor approach." Increasing use of nitrogen fertilizers is leading to higher N_2O levels in the atmosphere.

In the study, scientists found that nitrous oxide in the atmosphere has risen steadily since the mid-20th century. This rise is strongly linked to an increase in nitrogen substrates released to the environment. Since the mid-20th century, the production of nitrogen fertilizers, widespread cultivation of nitrogen-fixing crops (such as clover, soybeans, alfalfa, lupins, and peanuts), and the combustion of fossil and biofuels have increased enormously the availability of nitrogen substrates in the environment. "The increased nitrogen availability has made it possible to produce a lot more food," Thompson said. "The downside is of course the environmental problems associated with it, such as rising N_2O levels in the atmosphere."

"This new publication demonstrates both how we can solve a problem of growing greenhouse gas emissions and how current efforts are falling short in some regions of the world," said co-author Eric Davidson of the University of Maryland Center for Environmental Science. "These emissions come primarily from using fertilizers to grow food and increasing livestock herds, but we have learned how to produce more food with less nitrous oxide emission."

"In Europe and North America, we have succeeded in decreasing growth in nitrous oxide emissions, an important contributor to climate change and stratospheric ozone depletion," he added. "Unfortunately, the same cannot be said for Asia and South America, where fertilizer use, intensification of livestock production, and the resulting nitrous oxide emissions are growing rapidly. “The good news is that this problem can be solved, but the less good news is that it will take a global effort, and we are far from there yet," he said.

Adapted from: https://www.sciencedaily.com

2. Skimming (30)

Choose from the list **A-F** the main idea for paragraphs **1-5**. There is one extra letter that you do not need to use.

A. Developing countries have succeeded in reducing N_2O emissions; whereas the others have not yet.
B. The increased nitrogen availability has made it possible to produce a lot more food.
C. More N_2O is being released into the atmosphere than previously estimated.
D. We are now being told that N_2O emissions pose no threat to the environment.
E. Increasing use of nitrogen fertilizers is leading to higher N_2O levels in the atmosphere.
F. People have learned how to produce more food with less N_2O emission.

Paragraph 1 ☐
Paragraph 2 ☐
Paragraph 3 ☐
Paragraph 4 ☐
Paragraph 5 ☐

3. Scanning (10)

1. ***What are carbon dioxide, methane and nitrous oxide?***
a. Hazardous liquids
b. Solid substances
c. Manmade objects
d. Greenhouse gases

2. ***Why is nitrous oxide harmful?***
a. It has a nasty smell
b. It is toxic for people
c. It is an ozone depleting substance
d. It causes flooding

3. ***What causes increasing nitrous oxide emissions?***
a. The increasing use of motor vehicles
b. The increasing use of nitrogen fertilizers
c. The increasing generation of biofuels
d. The increasing use of natural resources

4. ***When have nitrous oxide emissions increased faster?***
a. 2009 onwards
b. The past two decades
c. The mid-20th century
d. Last year

5. ***What is nitrogen fertilizer used for?***
a. To clear land
b. To grow flowers
c. To produce food
d. It is NOT mentioned

6. ***What factors are associated with the rise of nitrous oxide in the atmosphere?***
a. The production of nitrogen fertilizers
b. Widespread cultivation of nitrogen-fixing crops
c. The combustion of fossil and biofuels
d. All of the above

7. ***What benefits did the increase of nitrous oxide in the atmosphere bring about?***
a. Environmental problems associated with nitrous oxide
b. Abundant food production
c. People's interest in agriculture
d. People's well being

8. ***What positive aspect does the publication show?***
a. How to solve the problem of growing greenhouse gas emissions
b. How current efforts are failing in some regions in the world
c. How leaders of the world are coming together to try to find a solution
d. None of the above

9. ***Where have nitrous oxide levels decreased?***
a. Asia and South America
b. Central America
c. Europe and North America
d. Africa

10. ***The text does NOT mention:***
a. How developed countries have managed to produce more food with less nitrous oxide emissions
b. The factors that contribute to the availability of nitrogen substrates in the environment
c. The effects that high levels of nitrous oxide have to the environment
d. Where the paper was published

4. Inferencing (25)

1. What are greenhouse gases?

a. Gases released from forests
b. Gases that trap heat in the atmosphere
c. Gases emitted from greenhouses
d. None of the above

2. What do greenhouse gases do to the environment?

a. They are harmless
b. They cause soil degradation
c. They contribute to global warming
d. All of the above

3. What is nitrous oxide?

a. A chemical compound
b. An oxide of nitrogen
c. A colorless gas
d. All of the above

4. Which of these activities is responsible for nitrous oxide emissions?

a. Farming
b. Mining
c. Deforestation
d. Fishing

5. What happens when the ozone layer is depleted?

a. There is less oxygen available in the environment
b. The earth is exposed to the sun's ultraviolet radiation
c. Animals eat less food and are nervous
d. It rains more often

6. What does the Intergovernmental Panel on Climate Change do?

a. It evaluates climate change science
b. It passes laws to control the climate
c. It fines governments for breaking the law
d. None of the above

7. How can more food be produced with less nitrous oxide emissions?

a. By growing food that does not need nitrogen fertilizers
b. By using organic fertilizers more efficiently
c. By using only synthetic fertilizers
d. By banning organic or synthetic fertilizers

8. Why is it difficult to reduce nitrous oxide emissions in Asia and South America?

a. People do not know about the environmental consequences of the use of nitrogen fertilizers
b. The governments do not raise environmental awareness among the population
c. People are not very environmentally aware
d. All of the above

9. What does the sentence "...we are far from there yet..." in line 29 imply?

a. We are a long way from our final destination
b. It will be difficult to reduce nitrous oxide in poor countries
c. The ozone layer is far from the Earth
d. Nitrous oxide is very expensive

10. What is the message of the text?

a. Nitrous oxide emissions have increased considerably in the atmosphere
b. Increasing nitrous oxide is the effect of nitrogen fertilizer use
c. Nitrous oxide is an ozone depleting gas
d. Nitrous oxide is a greenhouse gas

5. Vocabulary (10)

1. The noun "study" in line 4 can be explained as:

a. school
b. research
c. advertisement
d. studio

2. ***The adverb "faster" in line 7 can be understood as:***

a. more slowly
b. more efficiently
c. more softly
d. more quickly

3. ***The noun "substrates" in line 12 can be replaced by:***

a. liquids
b. solid waste
c. substances
d. vegetables

4. ***The verb "solve" in line 19 can be replaced by:***

a. create
b. attack
c. have
d. present

5. ***The adjective "current" in line 20 can be explained as:***

a. present-day
b. actual
c. real
d. past

6. ***The noun "depletion" in line 25 can be replaced by:***

a. layer
b. growth
c. reduction
d. dust

7. ***The noun "livestock" in line 27 can be understood as:***

a. farm animals
b. wild animals
c. endangered species
d. crops

8. ***The verb "growing" in line 28 can be described as:***

a. releasing
b. studying
c. coming
d. increasing

9. ***The noun "effort" in line 29 can be explained as:***

a. wish
b. need
c. attempt
d. desire

10. ***The verb "said" in line 29 can be understood as:***

a. swore
b. promised
c. replied
d. begged

Task 1

6. Reference (20)

Write the referent word(s) at the end of each sentence.

1. What does the subject pronoun "we" in line 3 refer to?
2. What does the object pronoun "it" in line 3 point to?
3. What does the noun phrase "the last decade" in line 8 stand for?
4. What does the noun phrase "This rise" in line 12 indicate?
5. What instances of nitrogen-fixing crops are given in lines 14-15?
6. Find a synonym for the word "disadvantage" in line 17.
7. What does the object pronoun "it" in line 18 refer to?
8. What does the noun phrase "these emissions" in lines 21-22 imply?
9. What does the noun phrase "this problem" in line 28 refer to?
10. What does the subject pronoun "it" in line 29 denote?