

4[B] – **Lessons from the Ozone Hole**  Lesson19 G2 Chobun TypeB 11.2(4B) A2E

1. In May 1985, scientists from the British Antarctic Survey shocked the world by
2. announcing the discovery of a huge hole in the ozone layer above the Antarctic.
3. Ozone is a gas usually formed from oxygen that is high in the earth's atmosphere.
4. The ozone layer is essential to life on our planet because it protects us from
5. harmful ultraviolet rays produced by the sun. Without the ozone layer, these rays
6. would cause cancer and other disease in both human beings and animals.

7. ☆ 多 Memorization **Further Questions&Sample Answers**

8. 1) What did the British Antarctic Survey discover?

9. *They discovered a huge hole in the ozone layer.*

10. 2) Why is the ozone layer essential to life?

11. *Because it protects us from harmful ultraviolet rays produced by the sun.*

12. The world's reaction to scientists' discovery was surprisingly quick.

13. Data showed that the ozone hole had been created by gases called

14. chlorofluorocarbons (CFCs), which were widely used in machines such as air

15. conditioners and refrigerators.

16. By 1988, 46 governments had signed the Montreal Protocol, a treaty that

17. banned the use of these gases. Eventually, this treaty was signed by every

18. member country of the United Nations—the only treaty ever to be signed by so

19. many nations.

20. It will be a long time before the ozone hole disappears completely, but it soon

21. stopped growing.

22. Persuading the international community to adopt the Montreal Protocol was

23. considered to be a great achievement for the environmental movement.

24. ☆ 多 Memorization **Further Questions&Sample Answers**

25. 3) What was the hole in the ozone layer caused by?

26. *It was created by gasses called CFCs.*

27. 4) What was so amazing about the Montreal Protocol?

28. *It was signed by every member country of the United Nations.*

29. According to scientists, there were two reasons why people responded so quickly

30. to the danger.

31. The first was that it was easy to understand.

32. If the hole kept growing, it would threaten life everywhere.

33. The second reason was that it was easy to replace the CFCs with*hydro

34. chlorofluorocarbons (HCFCs), gases that do much less damage to the ozone layer.

35. Unfortunately, though, HCFCs have their own problems.

36. Not only do they contribute to global warming, but they may also be a major

37. factor in the development of acid rain.



*HCFCs= hydrochlorofluorocarbons =ヒドロクロロフルオロカーボン

温暖化現象の原因となりうるフロンガスの代わりとして、半導体の製造過程や冷蔵庫などに利用されている物質。ハイドロフルオロカーボンやパーフルオロカーボン、六フッ化硫黄などがある。

38. ☆ 多 Memorization Further Questions&Sample Answers

39. 5) What was one reason people responded so quickly to the danger?

40. ① *If the hole kept growing it would threaten life everywhere.*

41. ② *It was easy to replace the CFCs with HCFCs which do much less damage.*

42. 6) What are problems with HCFCs?

43. *They contribute to global warming and they may be a major factor in the development of acid rain.*

44. Does this mean that the ban on CFCs was a bad idea?

45. The ozone hole was a real danger and, without the ban, it would have quickly grown to cover the whole planet.

47. Stopping its growth was a major victory. Nevertheless, the difficulties caused by HCFCs show how complicated environmental problems can be.

49. Above all, they demonstrate how important it is for us to find a way to control the main cause of global warming—the harmful gases that we keep putting into the atmosphere.

52. ☆ 多 Memorization Further Questions&Sample Answers

53. 7) What would have happened had the ban not happened?

54. *It would have quickly grown to cover the whole planet.*

55. 8) What did the HCFCs demonstrate?

56. *They demonstrated it is important for us to find a way to control harmful gases we put into the atmosphere.*

59. (37) The ozone layer is important because it

60. 1 helps preserve the oxygen necessary for life.

61. 2 protects us from rays that can cause serious diseases.

62. 3 allows us to calculate the amount of pollution in the air.

63. 4 stops the earth's atmosphere from being damaged by the sun.

64. (38) Why was the Montreal Protocol seen as a great success for the environmental movement?

66. 1 It forced governments to do more research on the ozone layer.

67. 2 It provided data showing that CFCs created the ozone hole.

68. 3 It attracted attention to the damage being done to nature.

69. 4 It was agreed to be more countries than any other treaty.

70. (39) What was one reason CFCs could be banned so quickly?

71. 1 Scientists were becoming concerned about acid rain.

72. 2 People recognized that global warming was a real problem.

73. 3 A gas that was not as harmful to the ozone layer was available.

74. 4 They were being produced in only a few places around the world.



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75. (40) **The ban on CFCs was a good idea because**

76. 1 it led to a reduction in global warming.
 77. 2 it saved the planet from a serious threat.
 78. 3 it reduced the amount of HCFCs in the air.
 79. 4 it showed how complicated nature is.

Review Questions

80. 1) **What did the British Antarctic Survey discover?**

81. *They discovered a huge hole in the ozone layer.*

82. 2) **Why is the ozone layer essential to life?**

83. *Because it protects us from harmful ultraviolet rays produced by the sun.*

84. 3) **What was the hole in the ozone layer caused by?**

85. *It was created by gasses called CFCs.*

86. 4) **What was so amazing about the Montreal Protocol?**

87. *It was signed by every member country of the United Nations.*

88. 5) **What was one reason people responded so quickly to the danger?**

89. ① *If the hole kept growing it would threaten life everywhere.*

90. ② *It was easy to replace the CFCs with HCFCs which do much less damage.*

91. 6) **What are problems with HCFCs?**

92. *They contribute to global warming and they may be a major factor in the development of acid rain.*

93. 7) **What would have happened had the ban not happened?**

94. *It would have quickly grown to cover the whole planet.*

95. 8) **What did the HCFCs demonstrate?**

96. *They demonstrated it is important for us to find a way to control harmful gases we put into the atmosphere.*



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解答: (37) 2 (38) 4 (39) 3 (40) 2



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日本語訳付

4[B] – Lessons from the Ozone Hole  Lesson 19 G2 Chobun dokkai 11.2(4B) A2E

97. In May 1985, scientists from the British Antarctic Survey
科学者 (かがくしゃ) たち イギリスの 南極 (なんきょく) 調査 (ちようさ)
 shocked the world by announcing the discovery of a huge hole in
衝撃 (しょうげき) をあたえた 発表 (はっぴよう) により 発見 (はっけん) 巨大 (きょだい) な
 the ozone layer above the Antarctic. Ozone is a gas usually formed
オゾン層 (そう) ~の上 (うえ) 南極 (なんきょく) ガス 形成 (けいせい) された
 from oxygen that is high in the earth's atmosphere. The ozone layer is
酸素 (さんそ) 大気 (たいき)
 essential to life on our planet because it protects us from harmful
なくてはならない 生命 (せいめい) 惑星 (わくせい) 守 (まも) る 有害 (ゆうがい) な
 ultraviolet rays produced by the sun. Without the ozone layer, these rays
紫外線 (しがいせん) もたらされる 光線 (こうせん)
 would cause cancer and other disease in both human beings and
~の原因 (げんいん) となる がん 病気 (びょうき) 人間 (にんげん)
 animals.

☆ 多 Memorization Further Questions & Sample Answers

105. 1) What did the British Antarctic Survey discover?
~を発見 (はっけん) する
 106. British Antarctic Surveyは何を発見しましたか。
 107. They discovered a huge hole in the ozone layer.
 108. 2) Why is the ozone layer essential to life? なぜオゾン層は生活に欠かせないのですか。
なくてはならない そう せい かつ か
 109. Because it protects us from harmful ultraviolet rays produced by the
守 (まも) る 有害 (ゆうがい) な 光線 (こうせん) ~によって作 (つく) られた
 110. sun.



111. The world's reaction to scientists' discovery was surprisingly quick.
反応 (はんのう) 発見物 (はっけんぶつ) びっくりするような 速 (はや) さ
 112. Data showed that the ozone hole had been created by gases called
情報 (じょうほう) 示 (しめ) した オゾンホール つくられた
 113. chlorofluorocarbons (CFCs), which were widely used in machines
フロンガス 幅広 (はばひろ) く用 (もち) いられた
 114. such as air conditioners and refrigerators. By 1988, 46 governments had
~のような エアコン 冷蔵庫 (れいぞうこ) 政府 (せいふ)
 115. signed the Montreal Protocol, a treaty that banned the
署名 (しよめい) した モントリオール (カナダ) 議定書 (ぎていしよ) 条約 (じょうやく) 禁止 (きんし) した
 116. use of these gases. Eventually, this treat way
使用 (しよう) 結局 (けっきょく) 取 (と) り扱 (あつか) い方法 (ほうほう)
 117. signed by every member country of the United Nations—the only
~によって署名 (しよめい) された すべての加盟国 (かめいこく) 国際連合 (こくさいれんごう)
 118. treaty ever to be signed by so many nations.
条約 (じょうやく) これまでに 国 (くに)
 119. It will be a long time before the ozone hole disappears completely, but it soon
消 (き) え失 (う) せる 完全 (かんぜん) に
 stopped growing. Persuading the international community to
増大 (ぞうだい) する 説得 (せつとく) する 共同体 (きょうどうたい)
 120. adopt the Montreal Protocol was considered to be a great
取 (と) り入 (い) れる モントリオール 議定書 (ぎていしよ) 熟考 (じゅっこう) された
 121. achievement for the environmental movement.
偉業 (いぎよう) 環境 (かんきよう) の 運動 (うんどう)

122. ☆ 多 Memorization Further Questions & Sample Answers

123. 3) What was the hole in the ozone layer caused by? オゾン層の穴の原因はなんですか。
~と呼 (よ) ばれた フロンガス
 124. It was created by gasses called CFCs.

125. **4)** What was so ^{驚 (おどろ) くべき} amazing about the Montreal Protocol?
126. Montreal Protocol の ^{おどろ} 驚くべきことはなんですか。
～によってサインされた
127. *It was signed by every member country of the United Nations.*
-
128. ^{～によれば} According to scientists, there were two ^{理由 (りゆう)} reasons why people responded so ^{答 (こた) えた} quickly to the ^{危険 (きけん) なもの} danger .
129. quickly to the danger .
130. The first was that it was easy to ^{理解 (りかい) する} understand.
131. If the hole ^{～し続 (つづ) けた} kept ^{増大 (ぞうだい) する} growing , it would ^{～に驚異 (きょうい) をあたえる} threaten ^{あらゆる場所 (ばしょ)} life everywhere.
132. The second reason was that it was easy to ^{取 (と) り替 (か) える} replace the CFCs with ^{少ない 損害 (そんがい)} the HCFCs with
133. *hydrochlorofluorocarbons (HCFCs), gases that do much less damage to the
134. ozone layer.
135. Unfortunately, though, HCFCs have their own problems.
不幸 (ふこう) にも しかし
136. Not only do they ^{～だけでなく} contribute to ^{助長 (じょちょう) する} global warming , but they may also be a ^{地球温暖化 (ちきゅうおんだんか)} major ^{重要 (じゅうよう) な 要因 (よういん)} factor in the development of ^{発達 (はったつ)} acid rain .
137. major factor in the development of acid rain .
- *HCFCs= hydrochlorofluorocarbons =ヒドロクロロフルオロカーボン
おんだんかげんしょう げんいん ふろんがす かわり はんどうたい せいぞうがてい れいぞうこ りよう さた ぶつしつ
 温暖化現象の原因となりうるフロンガスの代わりにとして、半導体の製造過程や冷蔵庫などに利用されている物質。ハ
 イドロフルオロカーボンやパーフルオロカーボン、六フッ化硫黄などがある。

138. ☆ 多 Memorization **Further Questions&Sample Answers**

139. **5)** What was one reason people ^{反応 (はんのう) した} responded so quickly to the danger?
140. ^{ひとびと} 人々がこの ^{危険 (きけん)} 危険に ^{さつきゅう} 早急に ^{はんのう} 反応した 1 つの ^{りゆう} 理由はなんですか。
脅威 (きょうい) を与 (あた) える
141. ① *If the hole kept growing it would threaten life everywhere.*
取 (と) り替 (か) える
142. ② *It was easy to replace the CFCs with HCFCs which do much less*
より少 (すく) ない
143. *damage.*
144. **6)** What are problems with HCFCs? HCFCs の ^{もんだい} 問題はなんですか。
助長 (じょちょう) する 要因 (よういん)
145. *They contribute to global warming and they may be a major factor in the*
development of acid rain.
-
147. ^{これは～の意味 (いみ) ですか} Does this mean that the ^{禁止 (きんし)} ban on CFCs was a bad idea?
禁止事項 (きんしじこう) がなければ
148. The ozone hole was a real danger and, ^{覆 (おお) う} without the ban , it would have quickly ^{全体 (ぜんたい)} grown to cover the ^{惑星 (わくせい)} whole planet .
149. grown to cover the whole planet .
150. Stopping its ^{増大 (ぞうだい)} growth was a ^{重要 (じゅうよう) な 勝利 (しょうり)} major victory .
151. Nevertheless, the ^{それにもかかわらず} difficulties caused by HCFCs show ^{困難 (こんなん)} how ^{どれほど} complicated ^{複雑 (ふくざつ) な}
152. environmental problems ^{環境 (かんきょう) の} can be. ^{なりえる} Above all, they ^{とりわけ} demonstrate ^{実証 (じっしょう) する} how important
153. it is for us to find a way to ^{制御 (せいぎよ) する} control the ^{主な} main ^{原因 (げんいん)} cause of global
154. warming—the ^{有害 (ゆうがい) な} harmful ^{加 (くわ) えること} gases that we keep ^{大気 (たいき)} putting into the atmosphere.



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155. ☆ 多 Memorization **Further Questions & Sample Answers**

156. 7) What would have happened had the ban not happened?
起 (おこ) った

157. もしこの禁止令きんしれいがなかったらどのようなことおが起こったでしょうか。
覆 (おお) う 全惑星 (ぜんわくせい)

158. *It would have quickly grown to cover the whole planet.*

159. 8) What did the HCFCs demonstrate? HCFCsが証明しょうめいしていることはなんですか。
証明 (しょうめい) する

160. *They demonstrated it is important for us to find a way to control harmful gases*
 161. *we put into the atmosphere.*

162. (37) The ozone layer is important because it オゾン層そう じゅうようは重要じゅうようである。なぜならそれは…
保護 (ほご) する 酸素 (さんそ) 必要 (ひつよう) な

163. 1 helps preserve the oxygen necessary for life.

164. 2 protects us from rays that can cause serious diseases.
重大 (じゅうだい) な 病気 (びょうき)

165. 3 allows us to calculate the amount of pollution in the air.
私達 (わたしたち) に~させる 計算 (けいさん) する 総計 (そうけい) 汚染 (おせん) 空气中 (くうきちゅう) の

166. 4 stops the earth's atmosphere from being damaged by the sun.

167. (38) Why was the Montreal Protocol seen as a great success for the
モンテリオール議定書 (ぎていしよ) ~とみられていた 成功 (せいこう)
 環境保護運動 (かんきょうほごうんどう)

168. environmental movement?

169. モンテリオール議定書は環境保護運動において素晴らしい成功せいこうだったのみられていたのはなぜですか。
政府 (せいふ) が~する事 (こと) を強制 (きょうせい) する 研究 (けんきゅう)

170. 1 It forced governments to do more research on the ozone layer.

171. 2 It provided data showing that CFCs created the ozone hole.
提供 (ていきょう) した 示 (しめ) す フロンガスが~をつくった

172. 3 It attracted attention to the damage being done to nature.
注意 (ちゅうい) をひきつけた 損傷 (そんしょう) 行 (おこな) われている

173. 4 It was agreed to be more countries than any other treaty.
意見 (いけん) が一致 (いっち) した より多 (おお) くの~ 他のどの国の条約 (じょうやく) より

174. (39) What was one reason CFCs could be banned so quickly?
法律 (ほうりつ) で禁止 (きんし) された

175. フロンガスがそれほど速はやく禁止きんしされた一つの理由ひと りゆう なんは何ですか。
心配 (しんぱい) した 酸性雨 (さんせいう)

176. 1 Scientists were becoming concerned about acid rain.
~を認 (みと) めた 現実 (げんじつ) の

177. 2 People recognized that global warming was a real problem.
有害 (ゆうがい) なほどではない 利用可能 (りようかのう) な

178. 3 A gas that was not as harmful to the ozone layer was available.
生産 (せいさん) されていた 世界中 (せかいじゅう) で

179. 4 They were being produced in only a few places around the world.

180. (40) The ban on CFCs was a good idea because フロンの禁止きんしが良よい案あんだったのは…
フロン禁止 (きんし) ~~導 (みちび) いた 削減 (さくげん)

181. 1 it led to a reduction in global warming.
救 (すく) った 惑星 (わくせい) 脅威 (きょうい) となるもの

182. 2 it saved the planet from a serious threat.
代替 (だいたい) フロン

183. 3 it reduced the amount of HCFCs in the air.
示 (しめ) した どれほど 複雑 (ふくざつ) な

184. 4 it showed how complicated nature is.

Review Questions

185. **1)** What did the ^{イギリスの} British Antarctic Survey ^{～を発見 (はっけん) する} discover ?

186. *They discovered a huge hole in the ozone layer.*

187. **2)** Why is the ozone layer ^{なくてはならない} essential to life?

188. *Because it protects us from ^{守 (まも) る} harmful ^{有害 (ゆうがい) な} ultraviolet ^{光線 (こうせん) ～によって作 (つく) られた} rays produced by the*
189. *sun.*

190. **3)** What was the hole in the ozone layer caused by?

191. *It was created by gasses ^{～と呼 (よ) ばれた} called ^{フロンガス} CFCs.*

192. **4)** What was so amazing about the Montreal Protocol?

193. *It ^{～によってサインされた} was signed by every member country of the United Nations.*

194. **5)** What was one reason people responded so quickly to the danger?

195. **①** *If the hole kept growing it would ^{脅威 (きょうい) を与 (あた) える} threaten life everywhere.*

196. **②** *It was easy to ^{取 (と) り替 (か) える} replace the CFCs with HCFCs which do much ^{より少 (すく) ない} less damage.*

197. **6)** What are problems with HCFCs?

198. *They ^{助長 (じょちよう) する} contribute to global warming and they may be a major ^{要因 (よういん)} factor in the*
199. *development of acid rain.*

200. **7)** What would have happened had the ban not happened?

201. *It would have quickly grown to ^{覆 (おお) う} cover ^{全惑星 (ぜんわくせい)} the whole planet.*

202. **8)** What did the HCFCs demonstrate?

203. *They demonstrated it is important for us to find a way to control harmful gases*
204. *we put into the atmosphere*

解答: (37) 2 (38) 4 (39) 3 (40) 2

