

3. At the 2000 Summer Olympics in Sydney, 83 percent of the medal-winning
4. swimmers wore the Speedo Fastskin swimsuit.
5. This revolutionary swimsuit allows wearers to glide through the water with much
6. less resistance, thanks to a material designed to mimic the skin of one nature's
7. fastest swimmers, the shark.
8. The Fastskin is an example of “biomimetrics,” the field of research in which
9. product designs are based on phenomena found in nature.

10. Further Questions & Sample Answers

11. 1) What did 83 percent of the medal-winning swimmers wear during the 2000
12. Summer Olympics?
13. *They wore Speedo Fastskin swimsuits.*
14. 2) What's “biomimetrics”?



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27. *Researchers are carrying out trials of a nearly painless hypodermic needle with a*
28. *design based on the mosquito's proboscis.*
29. 4) Why have researchers in the United States been studying the humpback
30. whale?
31. *They hope to develop wind turbines that can turn even at low wind speeds.*
32. Given that natural organisms have evolved over millions of years, researchers in
33. the field of biomimetrics can be confident that they are imitating extremely
34. efficient systems.
35. Nevertheless, they face great difficulty in copying all aspects of nature's complex
36. designs.
37. The makers of the Stickybot, a robot designed to copy the gecko lizard's ability to
38. climb smooth glass surfaces, envisioned it being used in search-and-rescue
39. operations.
40. Unfortunately, the technological limitations mean the robot can only climb at the
41. expense of speed—unlike the gecko, which can climb incredibly quickly.

42. Mark Cutkosky, one of the Stickybot's developers, admits that in order to build
43. the robot at all, "there are a lot of things about the gecko that we simply had to
44. ignore."

45. Further Questions & Sample Answers

46. 5) Why are researchers in the field of biomimetics confident about imitating
47. animals?

48. *Given that natural organisms have evolved over millions of years, researchers in
49. the field of biomimetics can be confident that they're imitating extremely
50. efficient systems.*

51. 6) Why couldn't the Stickybot be used in search and rescue operations?

52. *The technological limitations mean that the robot can only climb at the expense
53. of speed—unlike the gecko.*

54. So far, the number of commercially successful biomimetics products has been
55. limited.

56. As technology continues to advance, however, biomimetics research may find it

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69. *Biomimetic projects tend to scare off investors because such projects lack clear
70. practical applications and don't guarantee immediate gains.*

71. 8) What's one example of a successful biomimetics product?

72. *The adhesive material Velcro was one of the earliest biomimetics products.*

***Choose the correct answer from these choices.**

(35) What has led to the increased interest in biomimetics in recent years?

73. 1. Products based on mosquitoes and humpback whales have experienced
74. commercial success.

75. 2. Scientifically advanced countries like Japan and the United States are
76. working together to develop biometric products.

77. 3. Investigations over the last two decades have shown that many of
78. Leonardo da Vinci's designs were biometric.

79. 4. Scientists from many fields are realizing that designs from nature can
80. provide them with new products.

81. **(36)** The creation of the Stickybot has shown that?

1. researchers should remember evolution is not perfect and may not always produce designs worth copying.
2. researchers need not include all aspects of natural designs to develop products whose overall performance matches nature.
3. current levels of technology can prevent researchers from producing designs as effective as those found in nature.
4. Geckos are actually faster but have worse climbing ability than researchers at first believed.

82. **(37)** What challenge do researchers in biomimetrics face when attempting to market their products?

1. Investors are usually only interested in opportunities that promise profits in the short term.

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88. *Biomimetics is the field of research in which product designs are based on*
89. *phenomena found in nature.*

90. **3)** What're biomimetric researchers in Japan doing?

91. *Researchers are carrying out trials of a nearly painless hypodermic needle with a*
92. *design based on the mosquito's proboscis.*

93. **4)** Why have researchers in the United States been studying the humpback
94. whale?

95. *They hope to develop wind turbines that can turn even at low wind speeds.*

96. **5)** Why are researchers in the field of biomimetrics confident about imitating
97. animals?

98. *Given that natural organisms have evolved over millions of years, researchers in*
99. *the field of biomimetrics can be confident that they're imitating extremely*
100. *efficient systems.*

101. **6)** Why couldn't the Stickybot be used in search and rescue operations?

102. *The technological limitations mean that the robot can only climb at the expense*
103. *of speed—unlike the gecko.*

104. 7) Why do biomimetric projects tend to scare off investors?

105. *Biomimetric projects tend to scare off investors because such projects lack clear practical applications and don't guarantee immediate gains.*

107. 8) What's one example of a successful biomimetric product?

108. *The adhesive material Velcro was one of the earliest biomimetric products.*

解答: (35) 4 (36) 3 (37) 1

109.

110.



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3[B] – The Natural Way



Lesson10 Pre1 Chobun dokkai

AP1E 10-2

111. At the 2000 Summer Olympics in Sydney, 83 percent of the medal-winning swimmers wore the Speedo Fastskin swimsuit.

競泳選手 (きょうえいせんしゅ) 着 (き) た

競泳水着 (きょうえいみずぎ)

112. This revolutionary swimsuit allows wearers to glide through the water with much less resistance thanks to a material designed to mimic the

画期的 (かっきてき) な 水着 (みずぎ)

着用者 (ちゃくようしゃ)

滑 (すべ) り抜 (ぬ) ける

113. This revolutionary swimsuit allows wearers to glide through the water with much less resistance thanks to a material designed to mimic the

抵抗 (ていこう)

~のおかげで

素材 (そざい)

再現 (さいげん) する

114. with much less resistance thanks to a material designed to mimic the

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122. This is not a new idea—Leonardo da Vinci designed aircraft in the same way —but biomimetics has taken off only in the last 10 to 15 years

方法 (ほうほう)

活気 (かっき) づく

最近 (さいきん) の

123. as more scientists from a variety of disciplines turn to nature for inspiration.

多様性 (たようせい)

規律 (きりつ)

124. In Japan, for example, researchers are carrying out trials of a nearly painless hypodermic needle with a design based on the mosquito's proboscis (the thin tube that forms part of its mouth).

例 (たと) えば

遂行 (すいこう) する 試 (こころ) み

126. Researchers in the United States are studying the humpback whale's flippers in the hope of developing wind turbines that can turn even at low wind speeds.

痛 (いた) みのない 皮下注射 (ひかちゅうしゃ) の 針 (はり)

蚊 (か) の

127. proboscis (the thin tube that forms part of its mouth).

口先 (くちさき)

薄 (うす) い

128. Researchers in the United States are studying the humpback whale's flippers in the hope of developing wind turbines that can turn even at low wind speeds.

研究者 (けんきゅうしゃ)

ザトウクジラの

ひれ

129. in the hope of developing wind turbines that can turn even at low wind speeds.

風力 (ふうりょく) タービン、原動機 (げんどうき)

130. wind speeds.

131. wind speeds.

Further Questions& Sample Answers

132. 3) What're biomimetics researchers in Japan doing?

133. 日本のバイオミメテックス (生体模倣技術) の研究者は何をしていますか。

134. Researchers are carrying out trials of a nearly painless hypodermic needle with a design based on the mosquito's proboscis.

135. 4) Why have researchers in the United States been studying the humpback whale?

136. アメリカの研究者はなぜザトウクジラを研究しているのですか。

137. They hope to develop wind turbines that can turn even at low wind speeds.

138. Given that natural organisms have evolved over millions of years, researchers in the field of biomimetics can be confident that they are

139. imitating extremely efficient systems.

141. Nevertheless, they face great difficulty in copying all aspects of nature's complex designs.

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142. 5) Why are researchers in the field of biomimetics confident about imitating animals?

153. Given that natural organisms have evolved over millions of years, researchers in the field of biomimetics can be confident

154. that they're imitating extremely efficient systems.

155. 6) Why couldn't the Stickybot be used in search and rescue operations?

156. Stickybot はなぜ捜索救助活動に使われないのですか。

157. The technological limitations mean that the robot can only climb at the expense of speed—unlike the gecko.

159. So far, the number of commercially successful biomimetic products has been limited.

161. As technology continues to advance, however, biomimetic research may find it easier to catch up with nature.

163. Nevertheless, history suggests that they need not only technical skill but also

沢山 (たくさん) の 持続性 (じぞくせい)

164. a great deal of persistence.

計画 (けいかく) 傾向 (けいこう) がある おじけづかせる 投資家 (とうしか)

165. Biomimetic projects tend to scare off investors because such projects

実用的 (じつようてき) な 利用法 (りようほう) 保証 (ほしょう) する 即時 (そくじ) の

166. lack clear practical applications and do not guarantee immediate gains.

粘着性 (ねんちやくせい) の

167. One of the earliest biomimetic products, the adhesive material Velcro, was

開発 (かいはつ) された

168. first developed by George de Mestral in the 1940s.

完全 (かんぜん) にする

169. It took years for de Mestral to perfect the design and decades

170. for a practical application to be found.

広 (ひろ) く

171. It was not until the 1970s that Velcro became widely used.

Further Questions& Sample Answers

172. 7) Why do biomimetic projects tend to scare off investors?

173. バイオミメティックス (生体模倣技術) の計画はなぜ投資家をおじけづかせたのですか。

174. Biomimetic projects tend to scare off investors because such projects lack clear practical applications and don't guarantee immediate gains.

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Leonardo da Vinci's designs were biometric.

科学者 (かがくしゃ) 分野 (ぶんや)

183. 4. Scientists from many fields are realizing that designs from nature can

与 (あた) える

provide them with new products.

184. (36) The creation of the Stickybot has shown that? Stickybot の創作は以下のことを示している。

研究者 (けんきゅうしゃ) 進化 (しんか) 完璧 (かんぺき)

185. 1. researchers should remember evolution is not perfect and may not always produce designs worth copying.

186. 2. researchers need not include all aspects of natural designs to develop

全体 (ぜんたい) の

products whose overall performance matches nature.

現在 (げんざい) の

187. 3. current levels of technology can prevent researchers from producing

有効 (ゆうこう) な

designs as effective as those found in nature.

実際 (じっさい) に

188. 4. Geckos are actually faster but have worse climbing ability than researchers at first believed.

189. (37) What challenge do researchers in biomimetics face when attempting to market their products? バイオミメティクス (生体模倣技術) の研究者が彼らの発明した製品を市場に広げようと試みた時、どのような試練に直面しますか。
投資家 (とうしか) 興味 (きょうみ) がある 機会 (きかい)
190. 1. Investors are usually only interested in opportunities that promise profits in the short term.
191. 2. The public reluctant to buy biomimetic products as it is suspicious of new developments in the field .
世間 (せけん) 気 (き) の進 (すす) まない 発展 (はってん) 分野 (ぶんや) 認識 (にんしき) された
192. 3. Biomimetics has yet to be recognized by the wider scientific community as a respectable field of research.
尊敬 (そんけい) すべき
193. 4. Product development takes so long that conventional products for the same purpose are usually released first.
開発 (かいはつ) 慣習的 (かんしゅうてき) な 目的 (もくてき)

Review Questions 

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198. whale?

199. *They hope to develop wind turbines that can turn even at low wind speeds.*

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_ Given that natural organisms have evolved over millions of years, researchers in the field of biomimetics can be confident

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204. 8) What's one example of a successful biomimetic product?

205. *The adhesive material Velcro was one of the earliest biomimetic products.*

206.

解答: (35) 4 (36) 3 (37) 1

207.



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