

**For Teachers:** Please have the students read the sentences one at a time and correct their pronunciation of each sentence then have them repeat after you. Wait until after they read the sentence (use the number in place of the missing word) to have the students choose the correct answer to fill in the blank. When the students finish the article, move on to the further questions.

日本語訳なしタイプ B もございます。スクロールダウンするとございますので好きな方をご利用下さい。

金星 (きんせい)

### 3[C] – The Venus Express



AP1E

09-3

欧州宇宙機関 (おうしゅううちゅうきかん)

宇宙船 (うちゅうせん)

1. In November 2005, the European Space Agency sent a spacecraft to study our closest planetary neighbor, Venus. The Venus Express is a modified design of the Mars Express, which was successfully put into orbit around Mars in 2003. The newer craft began orbiting Venus in May 2006 and has since been used to study the planet's dense atmosphere. The mission also comes after a long period of declining curiosity about the planet. "You can think of this mission as the return to the forgotten planet," said Don McCoy, project manager for the Venus Express. "We are going back to find answers to questions that are a lot more important to Earth today than they were 30 years ago."

**Further Questions&A**\*Ask student to answer the question on their own at first. If the student can't answer correctly, have him look at the last page and read the "example answer" for the question. Have the student try to memorize the answer, if it's too long or difficult, you should divide the sentence into 2 or 3 parts to make it easier to remember. Once they have memorized the answer, the teacher should ask the question one last time so that the student can practice answering. Also if you find any mistakes, please mark the page and let me know ASAP.

2.1) When did the Venus Express begin orbiting Venus?

3. Venus Express はいつ金星の軌道にのりましたか。

4.2) Why is the European Space Agency going back to Venus?

5. 欧州宇宙機関はなぜ金星に戻ったのですか。

6.

7.1) It began orbiting Venus in May 2006.

8.2) They are going back to find answers to questions that are a lot more important to Earth today than they were 30 years ago.

9.

10. Venus and Earth are of a similar size, and both orbit the Sun in the

ゴールドロックス・ゾーン

"Goldilocks zone," an area of space considered by astronomers to be neither too hot nor too cold to support life. Despite this, Earth's sister planet, as Venus is sometimes called, has an average surface temperature of 465°C and a covering of

硫酸 (りゅうさん)

大気 (たいき) の

thick clouds of sulfuric acid. In addition, the atmospheric pressure at the surface is over 90 times that of Earth. This makes it the solar system's most

適 (てき) さない

hostile planet, despite its prime location. Scientists are keen to learn more.

"It's very disturbing that we don't understand the climate on a planet that's so much like Earth," said Fred Taylor, a professor of physics at Oxford University.

### Further Questions&A



11.3) What is the average surface temperature of Venus?

12.金星の平均的な表面温度は何度ですか。

13.4) What about Venus is disturbing?

14.金星について憂慮すべきこととは何ですか。

15.3) Venus has an average surface temperature of 465°C.

16.4) It's very disturbing that we don't understand the climate on a planet that's so much like Earth.

17. Taylors and other scientists believe that Venus used to have as much water as Earth, but became the victim of a change in its climatic conditions. On Earth, the greenhouse effect traps just enough heat to keep us comfortably warm. On Venus, the same effect adds several hundred degrees. It is unknown what caused the greenhouse effect to become out of control on Venus, but many now believe that this led to the evaporation of the planet's oceans, which in turn would have made the problem worse. On Earth, much of the greenhouse gas carbon dioxide is absorbed by the oceans, where it is gradually deposited as rock over time. This process would have stopped on Venus when the planet lost its oceans. The result is that carbon dioxide, which is highly efficient at trapping heat, now forms around 96 percent of the planet's atmosphere.

## Further Questions & Answers

18.5) What do scientists believe about Venus?

19.金星に関して科学者たちが信じている事とは何ですか。

20.6) What caused the greenhouse effect to become out of control on Venus?

21.金星において温室効果の程度が抑えきれないほどの状態になったのはなぜですか。

22.7) What is the result of the oceans on Venus being lost?

23.金星で海が失われた結果、どうなっていますか。

24.5) They believe that Venus used to have as much water as Earth, but became the victim of a change in its climatic conditions.

25.6) It is unknown what caused the greenhouse effect to become out of control on Venus.

26.7) The result is that carbon dioxide, which is highly efficient at trapping heat, now forms around 96 percent of the planet's atmosphere.

27. A further theory that may help explain the lack of water on Venus is based on the fact that the planet does not have a magnetic field. Earth's atmosphere is protected from solar wind—the stream of particles emitted by the Sun—because a magnetic field surrounds our planet. The absence of such protection on Venus means that solar wind comes into contact with the upper atmosphere and constantly carries away oxygen and hydrogen ions—the constituents of water. Observations made by the Venus Express indicate that this process is indeed occurring. The Venus mission is now focusing on the

相互作用 (そうごさよう)

interaction between the planet's atmosphere and its surface. Taylor hopes the results will shock people on Earth into realizing the danger of becoming complacent about our own greenhouse effect.

### Further Questions&A



28. **8) What is another theory that may explain the lack of water on Venus?**

29. 金星に水がないことを説明するもう一つの理論とは何ですか。

30. **9) What does the absence of a magnetic field mean for Venus?**

31. 磁場がないことは金星にとって何を意味していますか。

32. **10) What does Taylor hope the result of the study will do?**

33. Taylorは調査の結果にどんなことを期待していますか。

34. **8) A further theory that may help explain the lack of water on Venus is based on the fact that the planet does not have a magnetic field.**

35. **9) The absence of such protection on Venus means that solar wind comes into contact with the upper atmosphere.**

36. **10) Taylor hopes the result will shock people on Earth into realizing the danger of becoming complacent about our own greenhouse effect.**

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



38. **(38) The European Space Agency's decision to launch the Venus Express shows the agency has**

39. 欧州宇宙機関が Venus Express の打ち上げを決めた事は、機関が～ことを示している。

40. **1. decided to return to Venus much earlier than it has originally planned.**

41. **2. renewed its interest in a planet that has been little studied for decades.**

42. **3. developed the technology to overcome problems experienced by similar missions in the past.**

43. **4. realized it needed to put a spacecraft in orbit to replace the Mars Express.**

44. **(39) One reason scientists are comparing Earth and Venus is because they**

45. 科学者たちが地球と金星を比べる理由は、

46. **1. wish to test their theory about why Venus, despite its location, experiences less cloud covering than Earth.**

47. **2. have new data about how the atmosphere of Venus prevents the trapping of carbon dioxide.**

48. **3. want to find out why the two sister planets have such differing climatic conditions.**

49. **4. are concerned that the amount of sulfuric acid in Earth's atmosphere is rising like it did on Venus.**

50. **(40) What is suggested as one cause of the high temperatures on Venus?**

51. 金星の気温が高いことの原因の一つとして示されていることは何ですか。

- 52.1. The greenhouse effect on the planet because extreme, eventually leading to very high levels of carbon dioxide in the atmosphere.
- 53.2. The boiling away of the oceans has led to a rise in the number of particles from the Sun that enter the planet's atmosphere.
- 54.3. The rock found on the surface of Venus is less efficient at retaining heat than the rock that exists on Earth.
- 55.4. The strong sunlight that the planet receives has reduced the level of its carbon-based minerals.
- 56.(41) What theory appears to have been confirmed as a result of observations made by the Venus Express?
- 57.Venus Express おこなが行った観測の結果、かきくくどんな理論が裏付けられるとおもわれますか。
- 58.1. The high level of hydrogen that has recently developed in Venus' atmosphere makes life impossible.
- 59.2. Venus is losing the water that is present in its atmosphere because it is not protected against solar wind.
- 60.3. The "Goldilocks zone" is the most likely place to find Earth-like planets.
- 61.4. A protective layer of carbon dioxide cannot form in Venus' extreme temperatures.
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## 62. Review Questions



- 63.1) When did the Venus Express begin orbiting Venus?
64. *It began orbiting Venus in May 2006.*
- 65.2) Why is the European Space Agency going back to Venus?
66. *They are going back to find answers to questions that are a lot more important to Earth today than they were 30 years ago.*
- 67.3) What is the average surface temperature of Venus?
68. *Venus has an average surface temperature of 465 °C.*
- 69.4) What about Venus is disturbing?
70. *It's very disturbing that we don't understand the climate on a planet that's so much like Earth.*
- 71.5) What do scientists believe about Venus?
72. *They believe that Venus used to have as much water as Earth, but became the victim of a change in its climatic conditions.*
- 73.6) What caused the greenhouse effect to become out of control on Venus?
74. *It is unknown what caused the greenhouse effect to become out of control on Venus.*
- 75.7) What is the result of the oceans on Venus being lost?
76. *The result is that carbon dioxide, which is highly efficient at trapping heat, now forms around 96 percent of the planet's atmosphere.*
- 77.8) What is another theory that may explain the lack of water on Venus?

78. *A further theory that may help explain the lack of water on Venus is based on the fact that the planet does not have a magnetic field.*
79. **9)** What does the absence of a magnetic field mean for Venus?
80. *The absence of such protection on Venus means that solar wind comes into contact with the upper atmosphere.*
81. **10)** What does Taylor hope the result of the study will do?
82. *Taylor hopes the result will shock people on Earth into realizing the danger of becoming complacent about our own greenhouse effect.*
- 83.

解答: (38) 2 (39) 3 (40) 1 (41) 2



**Type B** 日本語訳なし

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AP1E 09-3

84. In November 2005, the European Space Agency sent a spacecraft to study our closest planetary neighbor, Venus. The Venus Express is a modified design of the Mars Express, which was successfully put into orbit around Mars in 2003. The newer craft began orbiting Venus in May 2006 and has since been used to study the planet's dense atmosphere. The mission also comes after a long period of declining curiosity about the planet. "You can think of this mission as the return to the forgotten planet," said Don McCoy, project manager for the Venus Express. "We are going back to find answers to questions that are a lot more important to Earth today than they were 30 years ago."

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86. **2)** Why is the European Space Agency going back to Venus?
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88. **1)** It began orbiting Venus in May 2006.
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91. Venus and Earth are of a similar size, and both orbit the Sun in the "Goldilocks zone," an area of space considered by astronomers to be neither too hot nor too cold to support life. Despite this, Earth's sister planet, as Venus is sometimes called, has an average surface temperature of 465°C and a covering of thick clouds of sulfuric acid. In addition, the atmospheric pressure at the surface is over 90 times that of Earth. This makes it the solar system's most hostile planet,

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