

Many scientists believe it would be possible to maintain a permanent human presence on Mars or the Moon. On the other hand, conditions on Venus are so extreme and inhospitable that maintaining a human presence there would be impossible. First, atmospheric pressure at Venus' surface is at least 90 times greater than the pressure at Earth' s surface. This means that a force of 100 kilograms is pressing down on every square centimeter of surface. All spacecraft that have landed on Venus have been crushed by this extreme pressure within an hour of landing. Almost anything humans might land on Venus would be crushed as well. Second, as far as we know, there are no reservoirs of water on Venus' surface, and the planet' s atmosphere, made up mostly of carbon dioxide, nitrogen, and sulfuric acid, contains hardly any oxygen or water vapor. Water and oxygen would therefore probably have to be supplied to Venus from Earth. The idea of ensuring a regular supply of water and oxygen from Earth is impractical in the extreme and would probably defeat the purpose of establishing a permanent station on Venus. Third, very little sunlight reaches the planet' s surface. About 60 percent of the sunlight that hits Venus is reflected back into space by the thick clouds that fill the atmosphere, which means that only 40 percent of the sunlight can get through the clouds. Below these clouds is a dense layer of carbon dioxide, which blocks even more light, so very little light reaches the surface. The lack of light would prevent the use of solar power cells, so humans could not get electricity to power their machines and equipment.

Now listen to part of a lecture on the topic you just read about. Setting up a permanent station on Venus may not be without challenges, but it is certainly possible. One solution that' s been proposed is to establish a station that would be floating in Venus' atmosphere like a balloon rather than standing on its surface. The station would float about 50 kilometers above Venus' surface. On a station located high in the atmosphere the problems the reading mentions can be solved. First, atmospheric pressure. Well, it is a well-known physical fact that high up in the atmosphere the pressure is much lower than at the surface. So, while the pressure at Venus' surface is too high for humans, 50 kilometers up in the atmosphere the pressure is equal to the normal pressure we are used to here on Earth. There would be no danger of the station getting crushed. Second, water and oxygen. Well, as you read, Venus' atmosphere contains compounds such as carbon dioxide and sulfuric acid. There are chemical processes that could be used on the station to make water and oxygen out of these compounds. So the water and oxygen necessary for human survival could be produced using chemical materials that can be easily obtained from Venus' atmosphere. It would not be necessary to import them. Third, the light-blocking clouds. Well, it' s true that there are still clouds 50 kilometers above Venus' surface. However, clouds above that level are not very thick, so there would be a considerable amount of sunlight filtering through. Moreover, as you read, the clouds reflect sunlight. The station could make use of this reflected light, too. In other words, its solar power cells could collect both the direct sunlight filtering from above and the sunlight reflected by the clouds below. More than enough electricity could be generated this way to power the station.

Summarize the points made in the lecture, being sure to explain how the proposal discussed in the lecture would solve the specific challenges described in the reading passage.

Some parents offer their school-age children money for each high grade (mark) they get in school. Do you think this is a good idea? Use specific reasons and examples to support your answer.