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# Climate Change Resulting in Increased Space Debris

## Description

Within the vast expanse of outer space surrounding Earth, the ominous effects of climate change are poised to wreak havoc, as per a recent study conducted by MIT. The research suggests that as the planet continues to heat up due to the relentless combustion of coal, oil, and gas, the available space for satellites in low Earth orbit could dwindle by a staggering one-third to 82% by the century's end. The reasoning behind this alarming prediction lies in the escalating clutter of space debris, exacerbated by climate change impeding the natural mechanisms that purify the space environment.

A crucial aspect of this phenomenon is the greenhouse effect, which warms the lower atmosphere while simultaneously cooling the upper regions where satellites hover in low orbit. This cooling effect leads to a decrease in atmospheric density at higher altitudes, diminishing the drag that typically draws space debris back toward Earth, resulting in their eventual disintegration. This celestial garbage ranges from minuscule fragments barely larger than a penny to larger pieces with the impact force of a hurtling bus, posing a significant threat to operational satellites and space exploration missions.

The relentless increase in greenhouse gas emissions ushered into the atmosphere by human activities will only exacerbate this issue, causing a further decline in atmospheric density. In light of these projections, scientists emphasize the critical need to acknowledge and address the orbital consequences of climate change to safeguard the long-term sustainability of space activities. As Will Parker, the lead researcher at MIT, articulates, the reliance on the atmosphere to cleanse space debris underscores the urgency of implementing measures to preserve the integrity of Earth's orbit. In a realm inundated with millions of debris pieces, maintaining a delicate balance between technological advancement and environmental responsibility is paramount to secure the future of space exploration and satellite operations.

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## Vocabulary List:

1. **Hazard** /'hæz.ərd/ (noun): A danger or risk that can cause harm or damage.
2. **Debris** /də'brɪ:/ (noun): Scattered pieces of waste or remains.
3. **Density** /'dɛn.sɪ.ti/ (noun): The degree of compactness of a substance; mass per unit volume.
4. **Exacerbate** /ɪg'zæs.ər.beɪt/ (verb): To make a problem or situation worse.
5. **Clutter** /'klʌt.ər/ (noun): A collection of things lying about in an untidy mass.
6. **Sustainability** /sə'steɪ.nə'bɪl.ɪ.ti/ (noun): The ability to be maintained at a certain rate or level especially in relation to the environment.

## Comprehension Questions



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## Multiple Choice

1. What type of debris poses a significant threat to operational satellites and space exploration missions?  
Option: Plastic waste  
Option: Celestial garbage  
Option: Biodegradable materials  
Option: Organic matter
2. What is the primary cause of the decreasing atmospheric density at higher altitudes where satellites hover?  
Option: Reduction in solar activity  
Option: Increase in greenhouse gases  
Option: Natural climate cycles  
Option: Growth of vegetation
3. Who is the lead researcher at MIT mentioned in the text?  
Option: Bill Johnson  
Option: Sarah Lee  
Option: Will Parker  
Option: Emily White
4. What is the key aspect of this celestial phenomenon that contributes to the issue of space debris?  
Option: Greenhouse effect  
Option: Ozone depletion  
Option: Acid rain  
Option: Photosynthesis
5. What is the potential decrease in available space for satellites in low Earth orbit by the end of the century?  
Option: 10%  
Option: 50%  
Option: 82%  
Option: 95%
6. What type of fuel combustion is mentioned as contributing to the heating of the planet?  
Option: Hydrogen  
Option: Coal, oil, and gas  
Option: Solar energy



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Option: Wind power

### Gap-Fill

13. The available space for satellites in low Earth orbit could dwindle by a staggering one-third to \_\_\_\_\_ by the century's end.
14. The chairman of Tata Group from 1990 to \_\_\_\_\_ was Ratan Naval Tata.
15. The reliance on the atmosphere to cleanse space debris underscores the urgency of implementing measures to preserve the integrity of Earth's \_\_\_\_\_.
16. The escalating clutter of space debris is exacerbated by climate change impeding the natural mechanisms that \_\_\_\_\_ the space environment.
17. The decrease in atmospheric density at higher altitudes results in a reduction of \_\_\_\_\_ that draws space debris back toward Earth.
18. Maintaining a balance between technological advancement and environmental responsibility is paramount for the future of space \_\_\_\_\_ and satellite operations.

### Answer

**Multiple Choice:** 1. Celestial garbage 2. Increase in greenhouse gases 3. Will Parker 4. Greenhouse effect 5. 82% 6. Coal, oil, and gas

**Gap-Fill:** 13. 82% 14. 2012 15. orbit 16. purify 17. drag 18. exploration

### CATEGORY

1. Sci/Tech - LEVEL6

### Date Created

2025/03/18

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