



# NASA Develops Innovative Solutions for Efficiently Cleaning Up Space Debris

## Description

NASA and its partners have recently discovered new, cost-effective ways to address the issue of orbital debris. A report released by NASA's Office of Technology, Policy, and Strategy provides insights into measuring the risks posed by orbital debris, focusing on economic evaluations over a 30-year period. This research builds on previous reports, improving estimates of risks to spacecraft and expanding the focus to include actions to mitigate new debris creation and track existing debris.

The study directly estimates the risks posed by space debris in dollars, modeling the costs associated with maneuvering spacecraft to avoid debris and dealing with close approaches. Additionally, it evaluates the cost-effectiveness of various actions to reduce the risk from orbital debris, such as shielding, tracking small debris, or remediating large debris. The report challenges traditional perceptions of cost-effective methods for addressing orbital debris, suggesting that debris remediation and quickly deorbiting defunct spacecraft may be valuable strategies.

Moving forward, the research team plans to share their findings with stakeholders and make the research code accessible to the public. This innovative approach to understanding and tackling orbital debris marks a significant step towards ensuring the sustainability of space activities.

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## Vocabulary List:

1. **Orbital debris** // (noun): Waste material left in orbit around Earth.
2. **Cost-effective** // (adjective): Producing good results without spending a lot of money.
3. **Insights** // (noun): Deep understanding or realization of a specific topic.
4. **Mitigate** // (verb): To make a problem or issue less severe.
5. **Remediation** // (noun): The act of correcting or undoing a problem or damage.
6. **Deorbiting** // (verb): Moving a satellite or spacecraft out of its orbit to re-enter Earth atmosphere.

## Vocabulary quizzes

### Multiple Choice ( Select the Correct answer for each question. )

1. What term is used to describe the curved path of a celestial object around a star?  
Option: Swirling  
Option: Orbits  
Option: Congestion  
Option: Deorbiting
2. What is defined as the beliefs or opinions that are generally held about someone or something?  
Option: Formation  
Option: Reputation  
Option: Insights  
Option: Alignment
3. What term is used to describe the process of converting information into a code to prevent unauthorized access?  
Option: Victim  
Option: Encrypt  
Option: Flexibility  
Option: Mitigate
4. What is the gradual development of something especially from a simple to a more complex form?  
Option: Orbital  
Option: Evolution  
Option: Lessened  
Option: Remediation



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5. In cybersecurity what does the term "endpoint" refer to?
- Option: Exploit
  - Option: Ransomware
  - Option: Endpoint
  - Option: Disk
6. What is the ability to adapt or be adapted to changing circumstances?
- Option: Spectators
  - Option: Cost-effective
  - Option: Flexibility
  - Option: Commitment
7. Who are individuals watching an event or performance called?
- Option: Conferencing
  - Option: Spectators
  - Option: Attendance
  - Option: Insights
8. What term is used to describe the overcrowding or blockage of something?
- Option: Congestion
  - Option: Vulnerable
  - Option: Iconic
  - Option: Cost-effective
9. What is the term used to describe the action of reducing the severity or seriousness of something?
- Option: Orbital debris
  - Option: Mitigate
  - Option: Orbital
  - Option: Attendance
10. What term is used to describe the arrangement in a straight line or in correct relative positions?
- Option: Alignment
  - Option: Formation
  - Option: Remediation
  - Option: Discovery

**Gap-Fill ( Fill in the blanks with the correct word from the vocabulary list. )**

11. \_\_\_\_\_ is a storage device used for storing and retrieving digital information.
12. The impact of the new regulations significantly \_\_\_\_\_ the company's profitability.



13. The \_\_\_\_\_ at the concert was much higher than expected.
14. The Eiffel Tower is considered to be one of the most \_\_\_\_\_ landmarks in the world.
15. Prompt \_\_\_\_\_ of the security breach helped prevent further data loss.
16. The \_\_\_\_\_ of the new government brought hope for positive change.
17. The company implemented a \_\_\_\_\_ solution to reduce operational expenses.
18. Market research provided valuable \_\_\_\_\_ into consumer preferences.
19. Efforts to clean up \_\_\_\_\_ in space are crucial to prevent collisions with satellites.
20. The satellite was intentionally maneuvered for \_\_\_\_\_ to ensure it would burn up in the atmosphere.

**Matching Sentences ( Match each definition to the correct word from the vocabulary list. )**

21. The _____ of the new planet was a result of cosmic processes over millions of years.
22. Without the latest security updates your computer may be _____ to cyber attacks.
23. His long-term _____ to the project earned him the respect of his colleagues.
24. The team _____ in their victory after a hard-fought game.
25. The _____ high at the conference indicated widespread interest in the topic.
26. _____ is a type of malicious software that blocks access to a computer system until a sum of money is paid.
27. Cybercriminals often _____ vulnerabilities in software to gain unauthorized access to systems.
28. Unusual network activity could be one of the _____ of a potential security breach.
29. Using open-source software can be a solution for small businesses with limited budgets.
30. The team worked _____ in perfect _____ to achieve their common goal.



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## Answer

**Multiple Choice:** 1. Orbits 2. Reputation 3. Encrypt 4. Evolution 5. Endpoint 6. Flexibility 7. Spectators  
8. Congestion 9. Mitigate 10. Alignment

**Gap-Fill:** 11. Disk 12. Lessened 13. Attendance 14. Iconic 15. Remediation 16. Formation 17. Cost-effective  
18. Insights 19. Orbital debris 20. Deorbiting

**Matching sentence:** 1. Formation 2. Vulnerable 3. Commitment 4. Rejoice 5. Attendance 6. Ransomware  
7. Exploit 8. Indicators 9. Cost-effective 10. Alignment

## CATEGORY

1. Sci/Tech - LEVEL3

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