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# Scientists Warn of Unprecedented Changes to Earth's Rotation

## Description

Every day, Earth takes slightly longer to rotate. This change is measured in fractions of a millisecond, but the forces causing it are enormous. A new study shows that the rate of this lengthening is "unprecedented" in the last 3.6 million years.

The study reveals that as polar ice sheets and glaciers melt due to climate change, the water moves from the poles to the oceans, shifting mass towards the equator. This movement slows down the Earth's spin, similar to how a figure skater slows down when they stretch their arms.

Previous studies showed that climate change affects our planet's spin. Researchers from the University of Vienna and ETH Zurich examined geological records to see if such changes happened before. They found no similar occurrences in history.

The length of a day has always changed due to various forces, like the Moon's gravity and the Earth's atmosphere. Climate change now stands as a major factor in this mix. To study past conditions, scientists used fossil remains from marine organisms to track sea-level shifts and Earth's rotation over millions of years.

Today, the change in day length is about 1.33 milliseconds per century. While this seems small, it requires a huge movement of mass, around 1,000 gigatonnes, shifting from the poles to oceans. If high emissions continue, climate change may exceed the Moon's gravitational influence, affecting navigation systems on Earth and in space.

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## Vocabulary List:

1. **rotate** //rəʊ'teɪt// (verb): to turn around a central point or axis
2. **unprecedented** //ʌn'prɛsɪ,dɛntɪd// (adjective): never seen or done before in history
3. **equator** //ɪ'kweɪtər// (noun): an imaginary line around Earth's middle
4. **glaciers** //ˈgleɪʃərz// (noun): large, slow-moving rivers of ice on land
5. **fossil** //ˈfɒsəl// (noun): the remains of plants or animals from long ago
6. **emissions** //ɪ'mɪʃənz// (noun): gases or particles sent into the air

## Comprehension Questions



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## Multiple Choice

1. What is the current change in day length measured as?  
Option: 1 millisecond per century  
Option: 1.33 milliseconds per century  
Option: 2 milliseconds per century  
Option: 3.6 milliseconds per century
2. What do researchers attribute the lengthening of Earth's rotation to?  
Option: The Moon's gravity  
Option: Climate change  
Option: Ocean tides  
Option: Plate tectonics
3. Where were the researchers from that conducted the study on Earth's rotation?  
Option: University of Cambridge and MIT  
Option: University of Vienna and ETH Zurich  
Option: Stanford University and Harvard  
Option: University of Tokyo and Oxford
4. What is the term used to describe the shift of water from the poles to the oceans?  
Option: Global warming  
Option: Climate migration  
Option: Mass movement  
Option: Sea-level rise
5. How long has the Earth been experiencing unprecedented change in its rotation according to the study?  
Option: 1.3 million years  
Option: 3.6 million years  
Option: 5 million years  
Option: 10 million years
6. What major factor now affects the change in day length?  
Option: Earth's atmosphere  
Option: The Moon's gravity  
Option: Climate change  
Option: Solar flares



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### True-False

7. The change in Earth's rotation is caused solely by the Moon's gravity.
8. Researchers discovered similar occurrences of day length change in history.
9. Melting polar ice sheets contribute to the slowing of Earth's spin.
10. The change in day length is currently about 1.33 seconds per century.
11. Scientists used fossil remains to study past conditions impacting Earth's rotation.
12. If high emissions continue, climate change may alter navigation systems on Earth.

### Gap-Fill

13. According to the study, the rate of lengthening is unprecedented in the last \_\_\_\_\_ million years.
14. Today, the change in day length is about 1.33 milliseconds per \_\_\_\_\_
15. The water moves from the poles to the oceans, shifting mass towards the \_\_\_\_\_
16. Previous studies indicated that climate change \_\_\_\_\_ our planet's spin.
17. To study past conditions, researchers examined fossil remains from \_\_\_\_\_ organisms.
18. If emissions continue to increase, climate change may exceed the Moon's gravitational \_\_\_\_\_

### Answer

**Multiple Choice:** 1. 1.33 milliseconds per century 2. Climate change 3. University of Vienna and ETH Zurich  
4. Mass movement 5. 3.6 million years

**True-False:** 7. False 8. False 9. True 10. False 11. True 12. True

**Gap-Fill:** 13. 3.6



14. century 15. equator 16. affects 17. marine 18. influence

## Vocabulary quizzes

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

1. What do fossil fuels release into the atmosphere?  
Option: Oxygen  
Option: Water vapor  
Option: Emissions  
Option: Nitrogen
2. What technology is commonly used for monitoring environmental changes?  
Option: Speakers  
Option: Sensors  
Option: Keyboards  
Option: Monitors
3. Which term describes the consistency of a system's performance?  
Option: Availability  
Option: Latency  
Option: Reliability  
Option: Security
4. What natural feature is impacted by climate change, leading to rising sea levels?  
Option: Mountains  
Option: Forests  
Option: Deserts  
Option: Glaciers
5. Who are individuals that exploit computer security vulnerabilities?  
Option: Programmers  
Option: Hackers  
Option: Users  
Option: Administrators
6. What term represents the delay before a transfer of data begins following an instruction?



- Option: Bandwidth
- Option: Timeliness
- Option: Latency
- Option: Pace

7. What type of display allows users to interact through touch?

- Option: LCD
- Option: LED
- Option: Touchscreen
- Option: CRT

8. What is the process of discovering the presence of something, often used in security?

- Option: Prevention
- Option: Detection
- Option: Analysis
- Option: Monitoring

9. Which verb means to convince someone to do something?

- Option: Defy
- Option: Doubt
- Option: Persuade
- Option: Reject

10. What word describes a general direction in which something is developing over time?

- Option: Pattern
- Option: Trend
- Option: Sign
- Option: Change

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

11. The rise in global temperatures is at an \_\_\_\_\_ rate, alarming scientists around the world.

12. The Earth's \_\_\_\_\_ is vital for protecting life from harmful solar radiation.

13. A thorough \_\_\_\_\_ of the data revealed significant patterns over the last decade.

14. The temperature is rising \_\_\_\_\_ as a result of climate change effects.



15. The Earth takes 24 hours to \_\_\_\_\_ once on its axis.
16. Certain systems are \_\_\_\_\_ to cyber attacks if not properly secured.
17. Participation in the workshop is \_\_\_\_\_, but encouraged for all employees.
18. \_\_\_\_\_ fuels remain the dominant source of energy in many countries today.
19. Implementing stronger \_\_\_\_\_ measures can help prevent data breaches.
20. Users enjoy \_\_\_\_\_ with apps that provide real-time feedback and updates.

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

21. The software's performance improved after the recent update.
22. Many people fell victim to the online scam that promised high returns.
23. The statue in the park is a tribute to its namesake, a famous local artist.
24. The climate near the equator is typically hot and humid year-round.
25. Spectrometers are essential tools used in many scientific experiments to analyze light.
26. Regular monitoring of the system is necessary to ensure its proper function.
27. Early detection of potential problems can save time and resources.
28. The trend in renewable energy adoption continues to grow worldwide.
29. The company is gradually expanding its operations to new markets.
30. Engineers focus on improving the reliability of critical systems in their designs.

**Answer**

**Multiple Choice:** 1. Emissions 2. Sensors 3. Reliability 4. Glaciers 5. Hackers 6. Latency 7. Touchscreen  
8. Detection 9. Persuade 10. Trend

**Gap-Fill:** 11. unprecedented 12. atmosphere 13. analysis 14. gradually 15. rotate 16. vulnerable 17. optional  
18. Fossil 19. security 20. interacting

**Matching sentence:** 1. performance 2. scam 3. namesake 4. equator 5. spectrometers 6. monitoring 7. detection



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8. trend 9. gradually 10. reliability

## CATEGORY

1. Sci/Tech - LEVEL3

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