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## Sustainable Fridges with Crystal Cooling: A Game-Changer!

### **Description**

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A revolutionary crystal has been developed that could change the way refrigerators and air conditioners work, providing cool air without harming our planet. Traditionally, these appliances use liquids that contribute to global warming when they escape into the environment. However, researchers at Deakin University in Australia, led by Jenny Pringle, have created a more sustainable solution using "plastic crystals" that can adjust their structure under pressure.

When these plastic crystals experience pressure, their molecules align in a specific pattern, absorbing heat and cooling the surroundings as the pressure is released. This cooling effect occurs within a temperature range suitable for household refrigerators and freezers, from -37°C (-34.6°F) to 10°C (50°F).

Despite the promising results, the crystals still require high pressures to function effectively, which could be a challenge for practical application. However, experts like David Boldrin from the University of Glasgow see the potential for these materials to significantly reduce carbon emissions in the cooling industry. Bing Li, from the Chinese Academy of Sciences, raises concerns about the crystals' long-term efficiency but remains optimistic about the technology's future prospects.

Topics: Climate-friendly cooling technology, Sustainable refrigeration, Environmental impact

## Vocabulary List:

- Refrigerators** /rə'frɪdʒ.ə.reɪ.tɔ:z/ (noun): Appliances used to keep food and drinks cold.
- Sustainable** /sə'steɪ.nə.bəl/ (adjective): Able to be maintained at a certain rate or level without harming the environment.
- Cooling** /'ku:.lɪŋ/ (noun): The process of reducing temperature.
- Contribute** /kən'trɪb.ju:t/ (verb): To give something especially money or resources to help achieve or provide something.
- Molecules** /'məl.ɪ.kju:lɪz/ (noun): Groups of two or more atoms bonded together.
- Efficiency** /ɪ'fɪʃ.ən.si/ (noun): The ability to achieve maximum productivity with minimum wasted effort or expense.

## Comprehension Questions

### Multiple Choice

1. What type of crystal has been developed to change the way refrigerators and air conditioners work?

Option: Diamond crystals  
Option: Plastic crystals

Option: Glass crystals

Option: Metal crystals

2. What is the temperature range suitable for the cooling effect of the plastic crystals in household refrigerators and freezers?

Option: -15°C to 25°C

Option: -30°C to 5°C

Option: -37°C to 10°C

Option: -20°C to 15°C

3. Who led the researchers at Deakin University in Australia in developing the plastic crystals?

Option: David Boldrin

Option: Bing Li

Option: Jenny Pringle

Option: David Boldrin

4. What concern does Bing Li raise regarding the plastic crystals?

Option: High cost

Option: Long-term efficiency

Option: Toxicity

Option: Temperature range

5. Which institution is David Boldrin associated with?

Option: Deakin University

Option: University of Glasgow

Option: Chinese Academy of Sciences

Option: University of Oxford

6. What range of temperatures do the plastic crystals provide cooling for?

Option: -50°C to 20°C

Option: -10°C to 30°C

Option: -37°C to 10°C

Option: 0°C to 40°C

### True-False

7. Plastic crystals are currently widely used in household refrigerators and freezers.

8. David Boldrin believes that plastic crystals can significantly reduce carbon emissions in the cooling

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industry.

9. Bing Li is pessimistic about the long-term efficiency of the plastic crystals technology.
10. The plastic crystals cooling effect occurs at a temperature range unsuitable for household refrigerators and freezers.
11. Bing Li is affiliated with Deakin University in Australia.
12. The plastic crystals require low pressure to function effectively.

### Gap-Fill

13. The plastic crystals cooling effect occurs within a temperature range suitable for household refrigerators and freezers, from -37°C to \_\_\_\_\_.
14. Researchers at Deakin University in Australia, led by Jenny Pringle, have developed plastic crystals that can adjust their structure under \_\_\_\_\_.
15. David Boldrin believes that plastic crystals have the potential to significantly reduce \_\_\_\_\_ emissions in the cooling industry.
16. Despite the promising results, the plastic crystals still require \_\_\_\_\_ pressures to function effectively.
17. Bing Li raises concerns about the \_\_\_\_\_ efficiency of the plastic crystals technology.
18. The plastic crystals technology developed by Deakin University offers a more \_\_\_\_\_ solution for refrigerators and air conditioners.

### Answer

**Multiple Choice:** 1. Plastic crystals 2. -37°C to 10°C 3. Jenny Pringle 4. Long-term efficiency 5. University of Glasgow

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

**Gap-Fill:** 13. 10°C



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14. pressure 15. carbon 16. high 17. long-term 18. sustainable

## Vocabulary quizzes

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

1. Which appliance is commonly used for cooling food and beverages?

- Option: Refrigerators
- Option: Microwaves
- Option: Blenders
- Option: Toasters

2. What term is used to describe the ability to accomplish a task with minimal wasted effort?

- Option: Efficiency
- Option: Ineffectiveness
- Option: Extravagance
- Option: Indifference

3. Which term refers to the act of transferring information from one place to another?

- Option: Communication
- Option: Isolation
- Option: Alienation
- Option: Concentration

4. Which concept describes openness accountability and honesty in actions and decisions?

- Option: Transparency
- Option: Opaqueness
- Option: Concealment
- Option: Ambiguity

5. Which term relates to the heart and blood vessels in the body?

- Option: Cardiovascular
- Option: Respiratory
- Option: Digestive
- Option: Skeletal

6. What is the term for the rivalry between businesses seeking to acquire more customers or market share?

Option: Competition  
Option: Collaboration  
Option: Cooperation  
Option: Unity

7. Which term describes a state of disorder and confusion?

Option: Chaos  
Option: Order  
Option: Harmony  
Option: Clarity

8. What is the term used to describe the collection of microbes living in and on the human body?

Option: Microbiome  
Option: Biomechanics  
Option: Hematology  
Option: Oncology

9. Which term is related to or caused by earthquakes?

Option: Seismic  
Option: Volcanic  
Option: Tectonic  
Option: Metamorphic

10. Which term means protecting from harm or damage?

Option: Safeguarding  
Option: Endangering  
Option: Compromising  
Option: Neglecting

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

11. Parents play a crucial role in the \_\_\_\_\_ and development of their children.

12. Some animals have \_\_\_\_\_ instincts to hunt and catch prey for survival.

13. She felt \_\_\_\_\_ before taking the exam due to her fear of failure.

14. The project experienced unexpected \_\_\_\_\_ pushing the deadline further.

15. The thunderstorm \_\_\_\_\_ the electricity supply in the entire neighborhood.

16. \_\_\_\_\_ conservation is essential to preserve natural resources and protect

ecosystems.

17. Chronic \_\_\_\_\_ in the body can lead to various health conditions over time.

18. His \_\_\_\_\_ to the success of the company were recognized in the annual awards ceremony.

19. Traditional cultural \_\_\_\_\_ are performed during important ceremonies and events.

20. Setting clear and achievable \_\_\_\_\_ helps individuals stay focused on their goals.

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

21. Fans and air conditioners are commonly used for lowering temperatures and providing comfort during hot weather.

22. Overcoming obstacles and difficulties often leads to personal growth and development.

23. The department is responsible for promoting and selling products to customers.

24. Students are encouraged to engage in various activities to enhance their learning experience.

25. The event was called off due to unforeseen circumstances resulting in disappointment for attendees.

26. Volunteers their time and effort to support charitable causes in the community.

27. A reduction in pollution levels can lead to an improvement in air quality and public health.

28. Using eco-friendly materials and practices helps in creating a(n) environment for future generations.

29. Visual aids and diagrams are often used to complex concepts in a more understandable manner.

30. Athletes from different countries against each other to win medals in the international sports event.

## Answer

**Multiple Choice:** 1. Refrigerators 2. Efficiency 3. Communication 4. Transparency 5. Cardiovascular  
6. Competition 7. Chaos 8. Microbiome 9. Seismic 10. Safeguarding

**Gap-Fill:** 11. nurture 12. predatory 13. anxious 14. delays 15. disrupted 16. Environmental 17. inflammation  
18. contributions 19. rituals 20. targets

**Matching sentence:** 1. Cooling



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2. Challenges 3. Sales 4. Participate 5. Cancellations 6. Contribute 7. Decrease 8. Sustainable 9. Illustrate  
10. Compete

## CATEGORY

1. Sci/Tech - LEVEL3

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