

THE ARTICLE

From <https://breakingnewsenglish.com/2108/210822-nuclear-fusion.html>

There has been a relentless quest to find sustainable energy sources in the past decades. One source of energy that has thus far eluded scientists is nuclear fusion. This is the Holy Grail of clean energy. Generations of physicists have tried to replicate this reaction. Scientists in the USA say they recreated the power of the Sun for a minuscule fraction of a second. Powerful lasers blasted a tiny target to create a reaction. The burst lasted just 100 trillionths of a second, but it created 10 quadrillion watts of power. Ten quadrillion is equal to 1 followed by 16 zeros. The power the scientists created is the equivalent of 6 per cent of all the energy from the Sun hitting Earth's surface at any given moment.

Nuclear fusion powers the Sun and other stars. The website cnet.com said it is "a long-sought-after panacea for many energy and environmental challenges". Nuclear fusion power plants could solve our clean energy conundrum and provide infinite, safe, clean and green power. It could also reverse the damage we do to the environment. Physicist Dr Debbie Callahan, who worked on the experiment, spoke about the breakthrough. She said it is a "huge advance for fusion" and a big step toward generating "a net-positive amount of energy". Futurism.com said: "The promise is as lucrative as it has ever been - an infinite supply of carbon-neutral energy without ever running the risk of a nuclear meltdown."

Sources: <https://www.cnet.com/news/get-20-off-an-entire-year-of-nordvpn-and-protect-your-online-activity-for-only-47-20/>
<https://www.yahoo.com/lifestyle/nuclear-fusion-breakthrough-could-unlock-215644282.html>
<https://futurism.com/scientists-edge-fusion-power-breakthrough>

VOCABULARY MATCHING

Paragraph 1

- | | |
|----------------|----------------------------------------------------------------------|
| 1. relentless | a. Extremely small; tiny. |
| 2. quest | b. A long search for something. |
| 3. sustainable | c. Failed to attain an achievement, or something desired or pursued. |
| 4. eluded | d. Non-stop. |
| 5. replicate | e. Equal in value, amount, function, meaning, etc. |
| 6. minuscule | f. Able to be maintained at a certain rate or level. |
| 7. equivalent | g. Make an exact copy of; reproduce. |

Paragraph 2

- | | |
|----------------------|---------------------------------------------------------------------------------------------------------------------------|
| 8. panacea | h. A sudden, dramatic, and important discovery or development. |
| 9. conundrum | i. Limitless or endless in space, extent, or size; impossible to measure or calculate. |
| 10. infinite | j. Making no net release of CO ₂ to the atmosphere, especially through offsetting emissions by planting trees. |
| 11. breakthrough | k. A solution or remedy for all difficulties or diseases. |
| 12. lucrative | l. A confusing and difficult problem or question. |
| 13. carbon-neutral | m. A disastrous event caused by the overheating or the reactor core in a nuclear reactor. |
| 14. nuclear meltdown | n. Producing a great deal of profit. |

BEFORE READING / LISTENING

From <https://breakingnewsenglish.com/2108/210822-nuclear-fusion.html>

1. TRUE / FALSE: Read the headline. Guess if a-h below are true (T) or false (F).

1. The article calls nuclear fusion the Holy Grail of clean energy. **T / F**
2. Scientists recreated the power of the Sun for a split second. **T / F**
3. Scientists created a reaction that lasted a billionth of a second. **T / F**
4. One quadrillion is a zero followed by 15 zeros. **T / F**
5. A website said nuclear fusion would address many challenges. **T / F**
6. The article says nuclear fusion wouldn't reverse damage done to Earth. **T / F**
7. A scientist called the test a huge advance for nuclear fusion. **T / F**
8. Nuclear fusion would end the risk of nuclear meltdowns. **T / F**

2. SYNONYM MATCH: (The words in **bold** are from the news article.)

- | | |
|------------------------|----------------|
| 1. relentless | a. cure-all |
| 2. eluded | b. tiny |
| 3. replicate | c. advance |
| 4. minuscule | d. evaded |
| 5. equivalent | e. problem |
| 6. panacea | f. possibility |
| 7. conundrum | g. non-stop |
| 8. breakthrough | h. profitable |
| 9. lucrative | i. copy |
| 10. risk | j. parallel |

3. PHRASE MATCH: (Sometimes more than one choice is possible.)

- | | |
|----------------------------------------|--------------------------------|
| 1. a relentless quest | a. panacea |
| 2. One source of energy that has thus | b. fraction of a second |
| 3. This is the Holy Grail | c. amount of energy |
| 4. for a minuscule | d. far eluded scientists |
| 5. the equivalent of 6 per cent of | e. clean energy conundrum |
| 6. a long-sought-after | f. all the energy from the Sun |
| 7. solve our | g. nuclear meltdown |
| 8. reverse the damage we do | h. to find sustainable energy |
| 9. a net-positive | i. to the environment |
| 10. without ever running the risk of a | j. of clean energy |

MULTIPLE CHOICE - QUIZ

From <https://breakingnewsenglish.com/2108/210822-nuclear-fusion.html>

- 1) What has there been a relentless quest to find?
 - a) the key to perpetual motion
 - b) the meaning of life
 - c) the elixir of life
 - d) sustainable energy sources
- 2) What does the article say is the Holy Grail of clean energy?
 - a) solar power
 - b) nuclear fusion
 - c) wind power
 - d) air power
- 3) What did lasers blast?
 - a) nuclear
 - b) a reactor
 - c) a tiny target
 - d) a conundrum
- 4) How long did the laser burst last?
 - a) just 100 trillionths of a second
 - b) 100 billionths of a second
 - c) 100 trillionths of a second
 - d) 10 quadrillionths of a second
- 5) What was the power generated the equivalent of?
 - a) six suns
 - b) 10 quadrillion volts
 - c) six per cent of the Sun's energy
 - d) 826 nuclear reactors
- 6) What did the website cnet.com call nuclear fusion?
 - a) a much-needed pick-me-up
 - b) a long-sought-after panacea
 - c) mind-blowing
 - d) mind-bending
- 7) What could nuclear fusion do to our environmental damage?
 - a) maintain a status quo
 - b) cancel it
 - c) exacerbate it
 - d) reverse it
- 8) What conundrum could nuclear fusion solve?
 - a) our clean energy conundrum
 - b) one of Einstein's theories
 - c) the overpopulation conundrum
 - d) the conundrum of all conundrums
- 9) What did a scientist say the test was a big step toward generating?
 - a) free energy
 - b) a non-polluted world
 - c) a net-positive amount of energy
 - d) huge profits for energy companies
- 10) What does nuclear fusion mean there is no risk of?
 - a) pollution
 - b) a nuclear meltdown
 - c) accidents
 - d) running out of power

CLEAN ENERGY DISCUSSION

STUDENT A's QUESTIONS (Do not show these to student B)

1. What did you think when you read the headline?
2. What images are in your mind when you hear the word 'energy'?
3. What do you know about nuclear fusion?
4. Have you ever been in a relentless quest?
5. Why is clean energy a Holy Grail?
6. How might nuclear fusion change the world?
7. Would you like to be a physicist?
8. How can we harness the power of the Sun?
9. What do you think of the numbers in the experiment?
10. What three adjectives best describe this story?

Nuclear fusion test could start an energy revolution – 22nd August, 2021
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CLEAN ENERGY DISCUSSION

STUDENT B's QUESTIONS (Do not show these to student A)

11. Did you like reading this article? Why/not?
12. What do you think of when you hear the word 'revolution'?
13. What do you think about what you read?
14. What energy challenges does our planet face?
15. What environmental challenges does Earth face?
16. What conundrums do you face in life?
17. What's the difference between nuclear fusion and nuclear fission?
18. What energy sources will we be using in 50 years' time?
19. What damage does a nuclear meltdown cause?
20. What questions would you like to ask the physicists?