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**Level 3 – 6th January, 2022**

## China's artificial sun five times hotter than real sun

**FREE online quizzes, mp3 listening and more for this lesson here:**

<https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

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**Please try Levels 0, 1 and 2 (they are easier).**

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# THE ARTICLE

From <https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

China has set a record for creating the highest heat ever recorded. Scientists created temperatures of up to 70,000,000°C in an "artificial sun". The new record was for keeping the heat at a temperature that is five times hotter than the sun. It did this for more than 17 minutes. The extreme heat was created in a nuclear fusion reactor. The reactor is part of the Experimental Advanced Super-conducting Tokamak project (EAST). It reproduces the natural reactions that happen inside our sun and other stars. The scientists want to develop the artificial sun to create a near-endless supply of clean energy. The EAST project has cost China more than \$950 billion. Total costs will run over \$1 trillion this year.

Scientists around the world have been trying for decades to develop nuclear fusion. They say it is the best way to produce clean energy. The nuclear fusion process needs no fossil fuels and leaves behind no dangerous waste. If scientists can make it work, the world will become greener and cleaner. It could also mean lower fuel bills. EAST set the new record in a laboratory. Nuclear fusion technology is still not advanced enough to become a global industry. However, researcher Dr Gong Xianzu, a nuclear fusion expert, says the EAST project is an important step. He said: "The recent operation lays a solid scientific and experimental foundation towards the running of a fusion reactor."

Sources: [http://www.china.org.cn/china/2022-01/01/content\\_77964589.htm](http://www.china.org.cn/china/2022-01/01/content_77964589.htm)  
<https://news.yahoo.com/china-switches-artificial-sun-five-105253561.html>  
<http://www.xinhuanet.com/english/20211231/415ad5413d0f4f4880de7cb64972bbf0/c.html>

# WARM-UPS

**1. THE SUN:** Students walk around the class and talk to other students about the sun. Change partners often and share your findings.

**2. CHAT:** In pairs / groups, talk about these topics or words from the article. What will the article say about them? What can you say about these words and your life?

record / heat / temperature / artificial / nuclear / scientist / supply / clean energy / decade / fossil fuels / waste / fuel bills / laboratory / global / expert / operation

Have a chat about the topics you liked. Change topics and partners frequently.

**3. CLEAN ENERGY:** Students A **strongly** believe we will have clean energy soon; Students B **strongly** believe we won't. Change partners again and talk about your conversations.

**4. GREEN ENERGY:** What do you know about these green energies? How green are they? Are they used in your country? Complete this table with your partner(s). Change partners often and share what you wrote.

	What I Know	How Green?	My Country
Nuclear			
Wind			
Solar			
Wave			
Geothermal			
Biofuels			

**5. HEAT:** Spend one minute writing down all of the different words you associate with the word "heat". Share your words with your partner(s) and talk about them. Together, put the words into different categories.

**6. BILLS:** Rank these with your partner. Put the worst bills at the top. Change partners often and share your rankings.

- Electricity bills
- Repair bills
- Water bills
- Phone bills
- Gas bills
- Tax bills
- Food bills
- Hospital bills

# VOCABULARY MATCHING

## Paragraph 1

- |                |                                                                                   |
|----------------|-----------------------------------------------------------------------------------|
| 1. set         | a. Created the best of something (a record) for others to try and beat or better. |
| 2. temperature | b. A special place where a nuclear reaction takes place.                          |
| 3. artificial  | c. How hot or cold someone or something is.                                       |
| 4. heat        | d. Very great; reaching a high or the highest degree.                             |
| 5. extreme     | e. Made by people, not nature.                                                    |
| 6. reactor     | f. The quality of being hot.                                                      |
| 7. supply      | g. Make something that is needed or wanted available to someone.                  |

## Paragraph 2

- |                   |                                                                               |
|-------------------|-------------------------------------------------------------------------------|
| 8. decade         | h. A printed or written paper showing the money owed for goods or services.   |
| 9. nuclear fusion | i. The part that is left over and not needed after a process has taken place. |
| 10. fossil fuel   | j. A period of ten years.                                                     |
| 11. waste         | k. An area of business activity (e.g. tourism, health, cars, oil...).         |
| 12. bill          | l. A reaction in which atoms react to release energy.                         |
| 13. industry      | m. The basic thing needed to build on or develop from.                        |
| 14. foundation    | n. Coal, oil and gas.                                                         |

# BEFORE READING / LISTENING

From <https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

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

1. Scientists in China created temperatures of 70 million° C. **T / F**
2. The scientists maintained the record heat for nearly 17 seconds. **T / F**
3. The artificial sun project in China is called FAST. **T / F**
4. The cost of the project is already over \$1 trillion. **T / F**
5. Scientists have been working on nuclear fusion for decades. **T / F**
6. The artificial sun project needs fossil fuels to work well. **T / F**
7. Nuclear fusion could mean we will pay less for fuel. **T / F**
8. A researcher said the artificial sun was an important step forward. **T / F**

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

- |                       |                |
|-----------------------|----------------|
| 1. <b>set</b>         | a. create      |
| 2. <b>keeping</b>     | b. established |
| 3. <b>extreme</b>     | c. base        |
| 4. <b>reproduces</b>  | d. limitless   |
| 5. <b>endless</b>     | e. great       |
| 6. <b>develop</b>     | f. specialist  |
| 7. <b>way</b>         | g. maintaining |
| 8. <b>lower</b>       | h. method      |
| 9. <b>expert</b>      | i. copies      |
| 10. <b>foundation</b> | j. reduced     |

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

- |                                           |                                |
|-------------------------------------------|--------------------------------|
| 1. creating the highest heat              | a. fuels                       |
| 2. The extreme heat was created in        | b. inside our sun              |
| 3. the natural reactions that happen      | c. over \$1 trillion this year |
| 4. create a near-endless supply           | d. advanced enough             |
| 5. Total costs will run                   | e. a nuclear fusion reactor    |
| 6. Scientists around the world have been  | f. clean energy                |
| 7. it is the best way to produce          | g. ever recorded               |
| 8. fossil                                 | h. trying for decades          |
| 9. Nuclear fusion technology is still not | i. foundation                  |
| 10. a solid scientific and experimental   | j. of clean energy             |

# GAP FILL

From <https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

China has (1) \_\_\_\_\_ a record for creating the highest heat ever recorded. Scientists created temperatures of up to 70,000,000°C in an "artificial sun". The new record was for (2) \_\_\_\_\_ the heat at a temperature that is five times hotter than the sun. It did this for more than 17 minutes. The (3) \_\_\_\_\_ heat was created in a nuclear fusion reactor. The reactor is (4) \_\_\_\_\_ of the Experimental Advanced Super-conducting Tokamak project (EAST). It reproduces the (5) \_\_\_\_\_ reactions that happen inside our sun and other (6) \_\_\_\_\_. The scientists want to develop the artificial sun to create a near-(7) \_\_\_\_\_ supply of clean energy. The EAST project has cost China more than \$950 billion. Total (8) \_\_\_\_\_ will run over \$1 trillion this year.

*extreme*  
*natural*  
*costs*  
*set*  
*endless*  
*part*  
*keeping*  
*stars*

Scientists around the world have been trying for (9) \_\_\_\_\_ to develop nuclear fusion. They say it is the best (10) \_\_\_\_\_ to produce clean energy. The nuclear fusion process needs no fossil fuels and leaves behind no dangerous (11) \_\_\_\_\_. If scientists can make it work, the world will become (12) \_\_\_\_\_ and cleaner. It could also mean lower fuel (13) \_\_\_\_\_. EAST set the new record in a laboratory. Nuclear fusion technology is still not advanced (14) \_\_\_\_\_ to become a global industry. However, researcher Dr Gong Xianzu, a nuclear fusion expert, says the EAST project is an important (15) \_\_\_\_\_. He said: "The recent operation lays a solid scientific and experimental foundation towards the (16) \_\_\_\_\_ of a fusion reactor."

*greener*  
*decades*  
*enough*  
*waste*  
*bills*  
*running*  
*way*  
*step*

# LISTENING – Guess the answers. Listen to check.

From <https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

- 1) China has set a record for creating the highest \_\_\_\_\_
  - a. heat never recorded
  - b. heat even recorded
  - c. heat ever recorded
  - d. heat every recorded
- 2) The extreme heat was created in a \_\_\_\_\_
  - a. nuclear fusion tractor
  - b. nuclear fusion vector
  - c. nuclear fusion rector
  - d. nuclear fusion reactor
- 3) It reproduces the natural reactions that happen inside our sun \_\_\_\_\_
  - a. and other starlets
  - b. and other star
  - c. and other stars
  - d. and another stars
- 4) The scientists want to develop the artificial sun to create a \_\_\_\_\_
  - a. near-endless supply
  - b. nor-endless supply
  - c. new-endless supply
  - d. nears-endless supply
- 5) Total costs will run over \$1 \_\_\_\_\_.
  - a. trillion these year
  - b. trillion this year
  - c. trillion that year
  - d. trillion those year
- 6) Scientists around the world have been \_\_\_\_\_
  - a. trying for decadence
  - b. trying for deck aids
  - c. trying for deck codes
  - d. trying for decades
- 7) The nuclear fusion process needs no fossil fuels and leaves behind \_\_\_\_\_
  - a. now dangerous waste
  - b. not dangerous waste
  - c. know dangerous waste
  - d. no dangerous waste
- 8) Nuclear fusion technology is still not advanced enough to become \_\_\_\_\_
  - a. a globally industry
  - b. a global industry
  - c. a global industrial
  - d. a global in dust tree
- 9) a nuclear fusion expert says the EAST project is \_\_\_\_\_
  - a. an importance step
  - b. an importantly step
  - c. an important step
  - d. an imp port ant step
- 10) a solid scientific and experimental foundation \_\_\_\_\_
  - a. towards a running
  - b. towards them running
  - c. towards the run in
  - d. towards the running

# LISTENING – Listen and fill in the gaps

From <https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

China has (1) \_\_\_\_\_ for creating the highest heat ever recorded. Scientists created temperatures of up to 70,000,000°C in an "artificial sun". The new record was for (2) \_\_\_\_\_ at a temperature that is five times hotter than the sun. It did this for more than 17 minutes. The (3) \_\_\_\_\_ created in a nuclear fusion reactor. The reactor is part of the Experimental Advanced Super-conducting Tokamak project (EAST). It (4) \_\_\_\_\_ reactions that happen inside our sun and other stars. The scientists want to develop the artificial sun to create a near-endless supply (5) \_\_\_\_\_. The EAST project has cost China more than \$950 billion. Total costs will run over \$1 (6) \_\_\_\_\_.

Scientists around the world have been (7) \_\_\_\_\_ to develop nuclear fusion. They say it is the best way to produce clean energy. The nuclear fusion process needs (8) \_\_\_\_\_ and leaves behind no dangerous waste. If scientists can make it work, the world will become greener and cleaner. It could also mean (9) \_\_\_\_\_. EAST set the new record in a laboratory. Nuclear fusion technology is still not advanced enough to (10) \_\_\_\_\_ industry. However, researcher Dr Gong Xianzu, a nuclear (11) \_\_\_\_\_ the EAST project is an important step. He said: "The recent operation lays a solid scientific and experimental foundation (12) \_\_\_\_\_ of a fusion reactor."



# COMPREHENSION QUESTIONS

From <https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

1. What temperature did the scientists create?
2. For how long was the record temperature maintained?
3. What is the abbreviation for the project?
4. Where does nuclear fusion take place naturally?
5. How much will costs rise to later this year?
6. For how long have scientists been working on nuclear fusion?
7. What does nuclear fusion not need?
8. What could be lower because of nuclear fusion?
9. What is nuclear fusion still not advanced enough to be?
10. What is Dr Gong Xianzu an expert on?

# MULTIPLE CHOICE - QUIZ

From <https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

- 1) What temperature did the scientists create?
  - a) 70,000,000°C
  - b) 17,000,000°C
  - c) 77,000,000°C
  - d) 7,000,000°C
- 2) For how long was the record temperature maintained?
  - a) 18 minutes
  - b) 15 minutes
  - c) 17 minutes
  - d) 16 minutes
- 3) What is the abbreviation for the project?
  - a) FAST
  - b) EAST
  - c) BEAST
  - d) YEAST
- 4) Where does nuclear fusion take place naturally?
  - a) inside plants
  - b) power stations
  - c) inside our bodies
  - d) inside our sun
- 5) How much will costs rise to later this year?
  - a) over \$1 trillion
  - b) around \$1 trillion
  - c) exactly \$1 trillion
  - d) just under \$1 trillion
- 6) For how long have scientists been working on nuclear fusion?
  - a) years
  - b) millennia
  - c) centuries
  - d) decades
- 7) What does nuclear fusion not need?
  - a) lots of cash
  - b) fossil fuels
  - c) a laboratory
  - d) atoms
- 8) What could be lower because of nuclear fusion?
  - a) global temperatures
  - b) snowfall
  - c) stress
  - d) fuel bills
- 9) What is nuclear fusion still not advanced enough to be?
  - a) safe
  - b) a game-changer
  - c) a global industry
  - d) cheap
- 10) What is Dr Gong Xianzu an expert on?
  - a) the sun
  - b) nuclear fusion
  - c) global industries
  - d) laboratories

# ROLE PLAY

From <https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

## **Role A – Electricity Bills**

You think electricity bills are the worst. Tell the others three reasons why. Tell them why their bills aren't as bad. Also, tell the others which of these are the easiest to pay (and why): water bills, phone / Internet bills or hospital bills.

## **Role B – Water Bills**

You think water bills are the worst. Tell the others three reasons why. Tell them why their bills aren't as bad. Also, tell the others which of these are the easiest to pay (and why): electricity bills, phone / Internet bills or hospital bills.

## **Role C – Phone/Internet Bills**

You think phone / Internet bills are the worst. Tell the others three reasons why. Tell them why their bills aren't as bad. Also, tell the others which of these are the easiest to pay (and why): water bills, electricity bills or hospital bills.

## **Role D – Hospital Bills**

You think hospital bills are the worst. Tell the others three reasons why. Tell them why their bills aren't as bad. Also, tell the others which of these are the easiest to pay (and why): water bills, phone / Internet bills or electricity bills.

# AFTER READING / LISTENING

From <https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

**1. WORD SEARCH:** Look in your dictionary / computer to find collocates, other meanings, information, synonyms ... for the words 'artificial' and 'sun'.

<b>artificial</b>	<b>sun</b>
-------------------	------------

- Share your findings with your partners.
- Make questions using the words you found.
- Ask your partner / group your questions.

**2. ARTICLE QUESTIONS:** Look back at the article and write down some questions you would like to ask the class about the text.

- Share your questions with other classmates / groups.
- Ask your partner / group your questions.

**3. GAP FILL:** In pairs / groups, compare your answers to this exercise. Check your answers. Talk about the words from the activity. Were they new, interesting, worth learning...?

**4. VOCABULARY:** Circle any words you do not understand. In groups, pool unknown words and use dictionaries to find their meanings.

**5. TEST EACH OTHER:** Look at the words below. With your partner, try to recall how they were used in the text:

<ul style="list-style-type: none"><li>• highest</li><li>• keeping</li><li>• 17</li><li>• happen</li><li>• develop</li><li>• run</li></ul>	<ul style="list-style-type: none"><li>• decades</li><li>• way</li><li>• behind</li><li>• enough</li><li>• expert</li><li>• running</li></ul>
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# THE SUN SURVEY

From <https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

Write five GOOD questions about the sun in the table. Do this in pairs. Each student must write the questions on his / her own paper.

When you have finished, interview other students. Write down their answers.

	STUDENT 1 _____	STUDENT 2 _____	STUDENT 3 _____
Q.1.			
Q.2.			
Q.3.			
Q.4.			
Q.5.			

- Now return to your original partner and share and talk about what you found out. Change partners often.
- Make mini-presentations to other groups on your findings.

# THE SUN 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 'artificial'?
3. What do you know about the sun?
4. Why is the sun so important?
5. What do you know about nuclear fusion?
6. What do you think of temperatures of 70,000,000°C?
7. What do you think of this new record?
8. Why is clean energy so important?
9. Do you think we will ever have clean energy?
10. What do you think of the cost of this project?

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# THE SUN 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 'sun'?
13. What do you think about what you read?
14. What do you want to know about the sun?
15. What are the best clean energies we have today?
16. What do you think of fossil fuels?
17. Do you worry about your fuel bills?
18. How might nuclear fusion change our lives?
19. What three adjectives best describe this story?
20. What questions would you like to ask the researchers?

## **DISCUSSION (Write your own questions)**

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

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

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## **DISCUSSION (Write your own questions)**

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

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

# LANGUAGE - CLOZE

From <https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

China has (1) \_\_\_\_\_ a record for creating the highest heat ever recorded. Scientists created temperatures of (2) \_\_\_\_\_ to 70,000,000°C in an "artificial sun". The new record was for keeping the heat at a temperature that is five times hotter than the sun. It did (3) \_\_\_\_\_ for more than 17 minutes. The extreme heat was created in a nuclear fusion reactor. The reactor is part of the Experimental Advanced Superconducting Tokamak project (EAST). It (4) \_\_\_\_\_ the natural reactions that happen inside our sun and other stars. The scientists want to develop the artificial sun to create a (5) \_\_\_\_\_-endless supply of clean energy. The EAST project has cost China more than \$950 billion. Total costs will (6) \_\_\_\_\_ over \$1 trillion this year.

Scientists around the world have been (7) \_\_\_\_\_ for decades to develop nuclear fusion. They say it is the best way (8) \_\_\_\_\_ produce clean energy. The nuclear fusion process needs no fossil fuels and leaves behind (9) \_\_\_\_\_ dangerous waste. If scientists can make it work, the world will become greener and cleaner. It could also mean (10) \_\_\_\_\_ fuel bills. EAST set the new record in a laboratory. Nuclear fusion technology is still not advanced (11) \_\_\_\_\_ to become a global industry. However, researcher Dr Gong Xianzu, a nuclear fusion expert, says the EAST project is an important step. He said: "The recent operation lays a solid scientific and experimental foundation towards the (12) \_\_\_\_\_ of a fusion reactor."

## Put the correct words from the table below in the above article.

- |     |                 |                |             |                |
|-----|-----------------|----------------|-------------|----------------|
| 1.  | (a) set         | (b) let        | (c) bet     | (d) wet        |
| 2.  | (a) down        | (b) along      | (c) up      | (d) over       |
| 3.  | (a) these       | (b) them       | (c) this    | (d) there      |
| 4.  | (a) takes place | (b) occurs     | (c) happens | (d) reproduces |
| 5.  | (a) near        | (b) close      | (c) far     | (d) distant    |
| 6.  | (a) walk        | (b) run        | (c) chase   | (d) dash       |
| 7.  | (a) try         | (b) tries      | (c) tried   | (d) trying     |
| 8.  | (a) for         | (b) to         | (c) of      | (d) at         |
| 9.  | (a) not         | (b) never      | (c) no      | (d) no's       |
| 10. | (a) cheaply     | (b) decrease   | (c) lesser  | (d) lower      |
| 11. | (a) ample       | (b) sufficient | (c) plenty  | (d) enough     |
| 12. | (a) walking     | (b) running    | (c) dashing | (d) sprinting  |



# SPELLING

From <https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

## Paragraph 1

1. mtesteuerapr of up to 70,000,000°C
2. a caurlne fusion reactor
3. natural raoetsni that happen inside our sun
4. elovdpe the artificial sun
5. create a near-endless pulpsy of clean energy
6. Total costs will run over \$1 orniiltl

## Paragraph 2

7. trying for acdseed
8. The nuclear fusion crsoeps
9. dangerous tsewa
10. in a aorrbaotyI
11. a nuclear fusion rpetxe
12. The recent epntorioa

# PUT THE TEXT BACK TOGETHER

From <https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

**Number these lines in the correct order.**

- ( ) bills. EAST set the new record in a laboratory. Nuclear fusion technology is still not advanced enough to
- ( ) a nuclear fusion reactor. The reactor is part of the Experimental Advanced Super-conducting Tokamak project
- ( ) way to produce clean energy. The nuclear fusion process needs no fossil fuels and leaves behind no dangerous
- ( ) stars. The scientists want to develop the artificial sun to create a near-endless supply of clean
- ( ) waste. If scientists can make it work, the world will become greener and cleaner. It could also mean lower fuel
- ( ) energy. The EAST project has cost China more than \$950 billion. Total costs will run over \$1 trillion this year.
- ( ) Scientists around the world have been trying for decades to develop nuclear fusion. They say it is the best
- ( ) and experimental foundation towards the running of a fusion reactor."
- ( ) expert, says the EAST project is an important step. He said: "The recent operation lays a solid scientific
- ( ) become a global industry. However, researcher Dr Gong Xianzu, a nuclear fusion
- ( ) of up to 70,000,000°C in an "artificial sun". The new record was for keeping the heat at a temperature that is five
- ( **1** ) China has set a record for creating the highest heat ever recorded. Scientists created temperatures
- ( ) (EAST). It reproduces the natural reactions that happen inside our sun and other
- ( ) times hotter than the sun. It did this for more than 17 minutes. The extreme heat was created in

# PUT THE WORDS IN THE RIGHT ORDER

From <https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

1. for creating record a Set highest heat . the
2. more this than for 17 It minutes . did
3. supply near-endless of Create clean a energy .
4. scientists want The develop the sun . to artificial
5. costs will this run \$1 trillion over Total year .
6. the been have trying . world Scientists around
7. energy . way the clean It's best produce to
8. fuels . fusion fossil no needs process nuclear The
9. not fusion technology enough is advanced still Nuclear
10. important step . an is project EAST The

# CIRCLE THE CORRECT WORD (20 PAIRS)

From <https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

China has *set / bet* a record for creating the highest heat ever recorded. Scientists created temperatures of up to 70,000,000°C in an "artificial sun". The new record was *to / for* keeping the heat at a temperature that is five times hotter than the sun. It *did / heated* this for more than 17 minutes. The *extreme / extremely* heat was created in a nuclear fusion reactor. The reactor *is / be* part of the Experimental Advanced Super-conducting Tokamak project (EAST). It reproduces *a / the* natural reactions that happen inside our sun and *another / other* stars. The scientists want to develop the artificial sun *for / to* create a near-endless supply of clean energy. The EAST project has *cost / priced* China more than \$950 billion. Total costs will *run / walk* over \$1 trillion this year.

Scientists around the world have been *tying / trying* for decades to develop nuclear fusion. They say it is the best way to produce *cleanser / clean* energy. The nuclear fusion process needs no *fossil / fossils* fuels and leaves behind no dangerous *wasting / waste*. If scientists can make it work, the world will become greener and cleaner. It could also *mean / meant* lower fuel bills. EAST set the new record in a *lavatory / laboratory*. Nuclear fusion technology is still not advanced *for / enough* to become a global industry. However, researcher Dr Gong Xianzu, a nuclear fusion *expat / expert*, says the EAST project is an important *step / stair*. He said: "The recent operation lays a solid scientific and experimental foundation towards the *ruining / running* of a fusion reactor."

**Talk about the connection between each pair of words in italics, and why the correct word is correct.**

# INSERT THE VOWELS (a, e, i, o, u)

From <https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

Ch\_n\_ h\_s s\_t \_ r\_c\_r\_d f\_r cr\_\_t\_ng th\_ h\_g\_h\_st  
h\_\_t \_v\_r r\_c\_r\_d\_d. Sc\_\_nt\_sts cr\_\_t\_d t\_m\_p\_r\_t\_r\_s \_f  
\_p t\_ 70,000,000°C \_n \_n "\_rt\_f\_c\_\_l s\_n". Th\_ n\_w  
r\_c\_r\_d w\_s f\_r k\_\_p\_ng th\_ h\_\_t \_t \_ t\_m\_p\_r\_t\_r\_  
th\_t \_s f\_v\_ t\_m\_s h\_tt\_r th\_n th\_ s\_n. \_t d\_d th\_s  
f\_r m\_r\_ th\_n 17 m\_n\_t\_s. Th\_ \_xtr\_m\_ h\_\_t w\_s  
cr\_\_t\_d \_n \_ n\_cl\_\_r f\_s\_\_n r\_\_ct\_r. Th\_ r\_\_ct\_r \_s  
p\_rt \_f th\_ \_xp\_r\_m\_nt\_l \_dv\_nc\_d S\_p\_r-c\_nd\_ct\_ng  
T\_k\_m\_k pr\_j\_ct (\_\_ST). \_t r\_pr\_d\_c\_s th\_ n\_t\_r\_l  
r\_\_ct\_\_ns th\_t h\_pp\_n \_ns\_d\_ \_\_r s\_n \_nd \_th\_r st\_rs.  
Th\_ sc\_\_nt\_sts w\_nt t\_ d\_v\_l\_p th\_ \_rt\_f\_c\_\_l s\_n t\_  
cr\_\_t\_ \_ n\_\_r-ndl\_ss s\_p\_ply \_f cl\_\_n \_n\_rgy. Th\_  
\_\_ST pr\_j\_ct h\_s c\_st Ch\_n\_ m\_r\_ th\_n \$950 b\_ll\_\_n.  
T\_t\_l c\_sts w\_ll r\_n \_v\_r \$1 tr\_ll\_\_n th\_s y\_\_r.

Sc\_\_nt\_sts \_r\_\_nd th\_ w\_rld h\_v\_ b\_\_n try\_ng  
f\_r d\_c\_d\_s t\_ d\_v\_l\_p n\_cl\_\_r f\_s\_\_n. Th\_y s\_y \_t \_s  
th\_ b\_st w\_y t\_ pr\_d\_c\_ cl\_\_n \_n\_rgy. Th\_ n\_cl\_\_r  
f\_s\_\_n pr\_c\_ss n\_\_ds n\_ f\_ss\_l f\_\_ls \_nd l\_\_v\_s  
b\_h\_nd n\_ d\_ng\_r\_\_s w\_st\_. \_f sc\_\_nt\_sts c\_n m\_k\_ \_t  
w\_rk, th\_ w\_rld w\_ll b\_c\_m\_ gr\_n\_r \_nd cl\_\_n\_r. \_t  
c\_\_ld \_ls\_ m\_\_n l\_w\_r f\_\_l b\_lls. \_\_ST s\_t th\_ n\_w  
r\_c\_r\_d \_n \_ l\_b\_r\_t\_ry. N\_cl\_\_r f\_s\_\_n t\_chn\_l\_gy \_s  
st\_ll n\_t \_dv\_nc\_d \_n\_\_gh t\_ b\_c\_m\_ \_ gl\_b\_l  
\_ndstry. H\_w\_v\_r, r\_s\_\_rch\_r Dr G\_ng X\_\_nz\_, \_  
n\_cl\_\_r f\_s\_\_n \_xp\_r\_t, s\_ys th\_ \_\_ST pr\_j\_ct \_s \_n  
\_mp\_r\_t\_nt st\_p. H\_ s\_\_d: "Th\_ r\_c\_nt \_p\_r\_t\_\_n l\_ys \_  
s\_l\_d sc\_\_nt\_f\_c \_nd \_xp\_r\_m\_nt\_l f\_\_nd\_t\_\_n t\_w\_rds  
th\_ r\_nn\_ng \_f \_ f\_s\_\_n r\_\_ct\_r."

# PUNCTUATE THE TEXT AND ADD CAPITALS

From <https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

china has set a record for creating the highest heat ever recorded scientists created temperatures of up to 70000000c in an artificial sun the new record was for keeping the heat at a temperature that is five times hotter than the sun it did this for more than 17 minutes the extreme heat was created in a nuclear fusion reactor the reactor is part of the experimental advanced superconducting tokamak project east it reproduces the natural reactions that happen inside our sun and other stars the scientists want to develop the artificial sun to create a nearendless supply of clean energy the east project has cost china more than 950 billion total costs will run over 1 trillion this year

scientists around the world have been trying for decades to develop nuclear fusion they say it is the best way to produce clean energy the nuclear fusion process needs no fossil fuels and leaves behind no dangerous waste if scientists can make it work the world will become greener and cleaner it could also mean lower fuel bills east set the new record in a laboratory nuclear fusion technology is still not advanced enough to become a global industry however researcher dr gong xianzu a nuclear fusion expert says the east project is an important step he said the recent operation lays a solid scientific and experimental foundation towards the running of a fusion reactor

# PUT A SLASH ( / ) WHERE THE SPACES ARE

From <https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

China has set a record for creating the highest heat ever recorded. Scientists created temperatures of up to 70,000,000°C in an "artificial sun". The new record was for keeping the heat at a temperature that is five times hotter than the sun. It did this for more than 17 minutes. The extreme heat was created in a nuclear fusion reactor. The reactor is part of the Experimental Advanced Super-conducting Tokamak project (EAST). It reproduces the natural reactions that happen inside our sun and other stars. The scientists want to develop the artificial sun to create an near-endless supply of clean energy. The EAST project has cost China more than \$950 billion. Total costs will run over \$1 trillion this year. Scientists around the world have been trying for decades to develop nuclear fusion. They say it is the best way to produce clean energy. The nuclear fusion process needs no fossil fuels and leaves behind no dangerous waste. If scientists can make it work, the world will become greener and cleaner. It could also mean lower fuel bills. EAST set the new record in a laboratory. Nuclear fusion technology is still not advanced enough to become a global industry. However, researcher Dr Gong Xianzu, a nuclear fusion expert, says the EAST project is an important step. He said: "The recent operation lays a solid scientific and experimental foundation toward the running of a fusion reactor."





# ACADEMIC WRITING

From <https://breakingnewsenglish.com/2201/220106-artificial-sun.html>

Clean energy is the most important goal in science. Discuss.

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# HOMEWORK

**1. VOCABULARY EXTENSION:** Choose several of the words from the text. Use a dictionary or Google's search field (or another search engine) to build up more associations / collocations of each word.

**2. INTERNET:** Search the Internet and find out more about this news story. Share what you discover with your partner(s) in the next lesson.

**3. THE SUN:** Make a poster about the sun. Show your work to your classmates in the next lesson. Did you all have similar things?

**4. FOSSIL FUELS:** Write a magazine article about ending all investment in fossil fuels immediately. Include imaginary interviews with people who are for and against this.

Read what you wrote to your classmates in the next lesson. Write down any new words and expressions you hear from your partner(s).

**5. WHAT HAPPENED NEXT?** Write a newspaper article about the next stage in this news story. Read what you wrote to your classmates in the next lesson. Give each other feedback on your articles.

**6. LETTER:** Write a letter to an expert on the sun. Ask him/her three questions about it. Give him/her three of your ideas on how we can use the sun. Read your letter to your partner(s) in your next lesson. Your partner(s) will answer your questions.

# ANSWERS

## VOCABULARY (p.4)

1. a    2. c    3. e    4. f    5. d    6. b    7. g  
8. j    9. l    10. n    11. i    12. h    13. k    14. m

## TRUE / FALSE (p.5)

- 1 T    2 F    3 F    4 F    5 T    6 F    7 T    8 T

## SYNONYM MATCH (p.5)

1. b	2. g	3. e	4. i	5. d
6. a	7. h	8. j	9. f	10. c

## COMPREHENSION QUESTIONS (p.9)

- 70,000,000°C
- 17 minutes
- EAST
- Inside our sun
- Over \$1 trillion
- Decades
- Fossil fuels
- Fuel bills
- A global industry
- Nuclear fusion

## WORDS IN THE RIGHT ORDER (p.19)

- Set a record for creating the highest heat.
- It did this for more than 17 minutes.
- Create a near-endless supply of clean energy.
- The scientists want to develop the artificial sun.
- Total costs will run over \$1 trillion this year.
- Scientists around the world have been trying.
- It's the best way to produce clean energy.
- The nuclear fusion process needs no fossil fuels.
- Nuclear fusion technology is still not advanced enough
- The EAST project is an important step.

## MULTIPLE CHOICE - QUIZ (p.10)

1. a    2. c    3. b    4. d    5. a    6. d    7. b    8. d    9. c    10. b

## ALL OTHER EXERCISES

Please check for yourself by looking at the Article on page 2.  
(It's good for your English ;-)