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## **Level 6**

### **Scientists turn CO2 emissions into stone**

**12th June, 2016**

<http://www.breakingnewsenglish.com/1606/160612-co2-emissions.html>

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

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# THE ARTICLE

From <http://www.BreakingNewsEnglish.com/1606/160612-co2-emissions.html>

Scientists have come up with a smart but simple way to deal with carbon dioxide emissions, by turning them back into stone. Researchers in Iceland pumped 220 tons of CO<sub>2</sub> deep underground into volcanic rock. It reacted with minerals in the rock and over a relatively short space of time, transformed into a chalk-like solid substance similar to limestone. The team expressed their surprise at both the success and the speed of the CO<sub>2</sub> conversion. Lead scientist Juerg Matter said: "Of our 220 tons of injected CO<sub>2</sub>, 95 per cent was converted to limestone in less than two years." He added: "It was a huge surprise to all the scientists involved in the project, and we thought, 'Wow! This is really fast'."

The scientists hope their experiment will be adapted on a larger, more industrial scale. It could help to alleviate the problem of growing CO<sub>2</sub> emissions entering the atmosphere and warming the planet. It could also become a key technique in carbon capture and storage (CCS) solutions. Many other CCS techniques have involved injecting and trapping CO<sub>2</sub> underground. However, there was always the problem of the emissions leaking their way back above ground and into the atmosphere. Dr Matter was enthusiastic about his team's experiments. He said: "We need to deal with rising carbon emissions and this is the ultimate permanent storage – turn them back to stone."

Sources: <http://www.bbc.com/news/science-environment-36494501>  
<http://www.theguardian.com/environment/2016/jun/09/co2-turned-into-stone-in-iceland-in-climate-change-breakthrough>  
<http://www.sciencealert.com/scientists-have-figured-out-how-to-turn-co2-into-solid-rock-within-months>

# WARM-UPS

**1. CO2:** Students walk around the class and talk to other students about CO2. 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?

scientists / simple / emissions / underground / volcanic / success / surprise / project / experiment / industrial / atmosphere / planet / carbon / storage / enthusiastic

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

**3. EMISSIONS:** Students A **strongly** believe countries that do not stick to strict emissions limits should be heavily punished; Students B **strongly** believe otherwise. Change partners again and talk about your conversations.

**4. CARBON FOOTPRINT:** How can we offset our carbon footprint? Complete this table with your partner(s). Change partners often and share what you wrote.

	Possibilities	Do you do this/these?
Driving		
Home energy		
Food		
Water		
Air travel		
Recycling		

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

**6. CLEAN ENERGY:** Rank these with your partner. Put the best clean energy at the top. Change partners often and share your rankings.

- solar power
- wind power
- wave power
- hydropower
- geothermal energy
- bio energy
- human power
- heat pump

# BEFORE READING / LISTENING

From <http://www.BreakingNewsEnglish.com/1606/160612-co2-emissions.html>

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

- a. The method to turn CO<sub>2</sub> into stone is very complex and difficult. **T / F**
- b. Researchers in Iceland pumped 220kg of CO<sub>2</sub> deep underground. **T / F**
- c. The substance the CO<sub>2</sub> changes into is similar to coal. **T / F**
- d. Scientists were surprised at how fast the CO<sub>2</sub> changed to stone. **T / F**
- e. Scientists hope people will now follow up their work on a larger scale. **T / F**
- f. Turning carbon into stone could be a new method of carbon storage. **T / F**
- g. This is the first technique to pump CO<sub>2</sub> underground. **T / F**
- h. A scientist said this method was the ultimate in permanent storage. **T / F**

**2. SYNONYM MATCH:** Match the following synonyms from the article.

- |                 |                  |
|-----------------|------------------|
| 1. come up with | a. enormous      |
| 2. deal with    | b. comparatively |
| 3. relatively   | c. greatest      |
| 4. conversion   | d. reduce        |
| 5. huge         | e. passionate    |
| 6. alleviate    | f. handle        |
| 7. key          | g. seeping (out) |
| 8. leaking      | h. created       |
| 9. enthusiastic | i. crucial       |
| 10. ultimate    | j. change        |

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

- |   |                            |
|---|----------------------------|
| 1. Scientists have come up with a smart | a. rock                    |
| 2. carbon dioxide                       | b. back above ground       |
| 3. volcanic                             | c. involved in the project |
| 4. over a relatively short              | d. industrial scale        |
| 5. all the scientists                   | e. emissions               |
| 6. larger, more                         | f. capture and storage     |
| 7. warming                              | g. but simple way          |
| 8. a key technique in carbon            | h. the planet              |
| 9. emissions leaking their way          | i. storage                 |
| 10. the ultimate permanent              | j. space of time           |

# GAP FILL

From <http://www.BreakingNewsEnglish.com/1606/160612-co2-emissions.html>

Scientists have come up with a (1) \_\_\_\_\_ but simple way to deal with carbon dioxide emissions, by turning them back into stone. Researchers in Iceland (2) \_\_\_\_\_ 220 tons of CO2 deep underground into volcanic rock. It reacted with minerals in the rock and over a (3) \_\_\_\_\_ short space of time, transformed into a chalk-like solid (4) \_\_\_\_\_ similar to limestone. The team (5) \_\_\_\_\_ their surprise at both the success and the speed of the CO2 conversion. Lead scientist Juerg Matter said: "Of our 220 tons of injected CO2, 95 per cent was (6) \_\_\_\_\_ to limestone in less than two years." He added: "It was a (7) \_\_\_\_\_ surprise to all the scientists (8) \_\_\_\_\_ in the project, and we thought, 'Wow! This is really fast'."

*pumped*  
*converted*  
*smart*  
*huge*  
*substance*  
*involved*  
*relatively*  
*expressed*

The scientists hope their experiment will be (9) \_\_\_\_\_ on a larger, more industrial scale. It could help to (10) \_\_\_\_\_ the problem of growing CO2 emissions entering the (11) \_\_\_\_\_ and warming the planet. It could also become a key (12) \_\_\_\_\_ in carbon capture and storage (CCS) (13) \_\_\_\_\_. Many other CCS techniques have involved injecting and trapping CO2 underground. However, there was always the problem of the emissions (14) \_\_\_\_\_ their way back above ground and into the atmosphere. Dr Matter was (15) \_\_\_\_\_ about his team's experiments. He said: "We need to deal with rising carbon emissions and this is the ultimate (16) \_\_\_\_\_ storage – turn them back to stone."

*solutions*  
*atmosphere*  
*adapted*  
*enthusiastic*  
*technique*  
*permanent*  
*alleviate*  
*leaking*

# LISTENING – Guess the answers. Listen to check.

From <http://www.BreakingNewsEnglish.com/1606/160612-co2-emissions.html>

- 1) Scientists have come up with a smart but simple way \_\_\_\_\_ carbon dioxide
  - a. to deal within
  - b. to deal without
  - c. to deal wither
  - d. to deal with
- 2) Researchers in Iceland pumped 220 tons of CO2 deep underground \_\_\_\_\_ rock
  - a. into volcano
  - b. into Vulcan
  - c. into volcanic
  - d. into volcanically
- 3) It reacted with minerals in the rock and over a relatively short \_\_\_\_\_
  - a. space for time
  - b. space of time
  - c. space of times
  - d. spaces of time
- 4) expressed their surprise at both the success and the speed of \_\_\_\_\_
  - a. the CO2 conversions
  - b. a CO2 conversion
  - c. the CO2 conversion
  - d. a CO2 converted
- 5) He added: "It was a huge surprise to all the \_\_\_\_\_"
  - a. scientists involved
  - b. scientists involves
  - c. scientists revolved
  - d. scientists revolves
- 6) their experiment will be adapted on a larger, more \_\_\_\_\_
  - a. industrial scale
  - b. industrial shale
  - c. industrial skill
  - d. industrial school
- 7) the problem of growing CO2 emissions entering the atmosphere and \_\_\_\_\_
  - a. warming the planets
  - b. warming the plant
  - c. warming the plants
  - d. warming the planet
- 8) It could also become a key technique in carbon capture and \_\_\_\_\_
  - a. storage (CCS) solution
  - b. storage (CSC) solutions
  - c. store age (CCS) solutions
  - d. storage (CCS) solutions
- 9) However, there was always the problem of the \_\_\_\_\_
  - a. emission leaking
  - b. emissions leaking
  - c. emissions leak in
  - d. emissions leaking in
- 10) We need to deal with rising carbon emissions and this is the ultimate \_\_\_\_\_
  - a. permanence storage
  - b. permanently storage
  - c. permanent storage
  - d. permanents storage

# LISTENING – Listen and fill in the gaps

From <http://www.BreakingNewsEnglish.com/1606/160612-co2-emissions.html>

Scientists have come up with a (1) \_\_\_\_\_ way to deal with carbon dioxide emissions, by turning them back into stone. Researchers in Iceland pumped 220 tons of CO2 deep underground (2) \_\_\_\_\_. It reacted with minerals in the rock and over a relatively short space of time, (3) \_\_\_\_\_ chalk-like solid substance similar to limestone. The team expressed their (4) \_\_\_\_\_ success and the speed of the CO2 conversion. Lead scientist Juerg Matter said: "Of our 220 (5) \_\_\_\_\_ CO2, 95 per cent was converted to limestone in less than two years." He added: "It was a huge surprise to all the scientists (6) \_\_\_\_\_, and we thought, 'Wow! This is really fast'."

The scientists hope their experiment will (7) \_\_\_\_\_ larger, more industrial scale. It could help (8) \_\_\_\_\_ problem of growing CO2 emissions entering the atmosphere and warming the planet. It could also become a key technique (9) \_\_\_\_\_ and storage (CCS) solutions. Many other CCS techniques have involved injecting and trapping CO2 underground. However, there was always the problem of the emissions leaking their (10) \_\_\_\_\_ ground and into the atmosphere. Dr Matter was (11) \_\_\_\_\_ his team's experiments. He said: "We need to deal with rising carbon emissions and this is (12) \_\_\_\_\_ storage – turn them back to stone."

# COMPREHENSION QUESTIONS

From <http://www.BreakingNewsEnglish.com/1606/160612-co2-emissions.html>

1. How much carbon dioxide did scientists pump into the ground?
2. What is the stone that the CO<sub>2</sub> changed into similar to?
3. What surprised the team about the conversion of CO<sub>2</sub> to stone?
4. How long did it take 95% of the CO<sub>2</sub> to turn to stone?
5. What word did the lead scientist use to express his surprise?
6. What kind of scale do the scientists hope the experiment will go to?
7. What does the abbreviation CCS mean?
8. What happened to CO<sub>2</sub> in previous attempts at pump it underground?
9. How did Dr Matter feel about his team's experiments?
10. What kind of storage did Dr Matter call his procedure?

# MULTIPLE CHOICE - QUIZ

From <http://www.BreakingNewsEnglish.com/1606/160612-co2-emissions.html>

- 1) How much carbon dioxide did scientists pump into the ground?
  - a) 2,000 tons
  - b) 220 tons
  - c) 200 tons
  - d) 212 tons
- 2) What is the stone that the CO<sub>2</sub> changed into similar to?
  - a) coal
  - b) quartz
  - c) diamond
  - d) limestone
- 3) What surprised the team about the conversion of CO<sub>2</sub> to stone?
  - a) the speed
  - b) the smell
  - c) the cost
  - d) the birds
- 4) How long did it take 95% of the CO<sub>2</sub> to turn to stone?
  - a) over two years
  - b) around two years
  - c) less than two years
  - d) two years and a day
- 5) What word did the lead scientist use to express his surprise?
  - a) yes
  - b) wow
  - c) gosh
  - d) awesome
- 6) What kind of scale do the scientists hope the experiment will go to?
  - a) a larger, industrial scale
  - b) lime scale
  - c) a digital scale
  - d) a volcanic scale
- 7) What does the abbreviation CCS mean?
  - a) captive carbon steam
  - b) CO<sub>2</sub> carbon site
  - c) carbon capture storage
  - d) coal-carbon system
- 8) What happened to CO<sub>2</sub> in previous attempts at pump it underground?
  - a) it leaked
  - b) it exploded
  - c) it became toxic
  - d) nothing
- 9) How did Dr Matter feel about his team's experiments?
  - a) enthusiastic
  - b) disappointed
  - c) hopeful
  - d) positive
- 10) What kind of storage did Dr Matter call his procedure?
  - a) ulterior preeminent storage
  - b) timely pre-emptive storage
  - c) ultra-prominent storage
  - d) ultimate permanent storage

# ROLE PLAY

From <http://www.BreakingNewsEnglish.com/1606/160612-co2-emissions.html>

## **Role A – Solar power**

You think solar power is the greatest form of clean energy. Tell the others three reasons why. Tell them things that aren't as good with their power. Also, tell the others which is the least effective of these (and why): wind power, wave power or geothermal power.

## **Role B – Wind power**

You think wind power is the greatest form of clean energy. Tell the others three reasons why. Tell them things that aren't as good with their power. Also, tell the others which is the least effective of these (and why): solar power, wave power or geothermal power.

## **Role C – Wave power**

You think wave power is the greatest form of clean energy. Tell the others three reasons why. Tell them things that aren't as good with their power. Also, tell the others which is the least effective of these (and why): wind power, solar power or geothermal power.

## **Role D – Geothermal power**

You think geothermal power is the greatest form of clean energy. Tell the others three reasons why. Tell them things that aren't as good with their power. Also, tell the others which is the least effective of these (and why): wind power, wave power or solar power.

# AFTER READING / LISTENING

From <http://www.BreakingNewsEnglish.com/1606/160612-co2-emissions.html>

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

<b>smart</b>	<b>simple</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>• come</li><li>• deep</li><li>• space</li><li>• both</li><li>• 95</li><li>• huge</li></ul>	<ul style="list-style-type: none"><li>• larger</li><li>• growing</li><li>• key</li><li>• always</li><li>• enthusiastic</li><li>• ultimate</li></ul>
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# CO2 SURVEY

From <http://www.BreakingNewsEnglish.com/1606/160612-co2-emissions.html>

Write five GOOD questions about CO2 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.

## CO2 DISCUSSION

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

1. What did you think when you read the headline?
2. What springs to mind when you hear the word 'environment'?
3. What do you think about what you read?
4. How worried are you about CO2 emissions?
5. How good an idea is turning CO2 back into stone?
6. How harmful are carbon dioxide emissions?
7. What would it be like to work on this experiment?
8. What do you do to reduce carbon dioxide emissions?
9. Why didn't scientists think of this before?
10. When was the last time you thought, 'Wow!'?

*Scientists turn CO2 emissions into stone – 12th June, 2016*  
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## CO2 DISCUSSION

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

11. Did you like reading this article? Why/not?
12. What will happen if scientists do not stop global warming?
13. Why do some politicians say global warming is not man made?
14. What other carbon storage solutions do you know of?
15. How good is your country at dealing with carbon emissions?
16. How would you deal with the problem of growing CO2 emissions?
17. Why do so many countries not stick to CO2 emissions limits?
18. Do the scientists deserve a Nobel Prize for this procedure?
19. Do you think this is the "ultimate permanent storage"?
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 <http://www.BreakingNewsEnglish.com/1606/160612-co2-emissions.html>

Scientists have come (1) \_\_\_\_\_ with a smart but simple way to deal with carbon dioxide emissions, by turning them back into stone. Researchers in Iceland (2) \_\_\_\_\_ 220 tons of CO2 deep underground into volcanic rock. It reacted with minerals in the rock and over a (3) \_\_\_\_\_ short space of time, transformed into a chalk-like solid substance similar to limestone. The team expressed their surprise at (4) \_\_\_\_\_ the success and the speed of the CO2 conversion. Lead scientist Juerg Matter said: "Of our 220 tons of (5) \_\_\_\_\_ CO2, 95 per cent was converted to limestone in less than two years." He added: "It was a huge surprise to all the scientists (6) \_\_\_\_\_ in the project, and we thought, 'Wow! This is really fast'."

The scientists hope their experiment will be adapted on a larger, more (7) \_\_\_\_\_ scale. It could help to alleviate the problem of growing CO2 emissions entering the atmosphere and warming the planet. It could also become a (8) \_\_\_\_\_ technique in carbon (9) \_\_\_\_\_ and storage (CCS) solutions. Many other CCS techniques have involved injecting and trapping CO2 underground. However, there was always the problem of the emissions (10) \_\_\_\_\_ their way back above ground and into the atmosphere. Dr Matter was (11) \_\_\_\_\_ about his team's experiments. He said: "We need to deal with rising carbon emissions and this is the (12) \_\_\_\_\_ permanent storage – turn them back to stone."

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

- |     |                |               |                |                  |
|-----|----------------|---------------|----------------|------------------|
| 1.  | (a) up         | (b) in        | (c) over       | (d) down         |
| 2.  | (a) primped    | (b) plumped   | (c) pumped     | (d) primed       |
| 3.  | (a) relative   | (b) relations | (c) relatively | (d) relatives    |
| 4.  | (a) between    | (b) twice     | (c) among      | (d) both         |
| 5.  | (a) injected   | (b) injecting | (c) injector   | (d) injection    |
| 6.  | (a) convoluted | (b) involved  | (c) revolved   | (d) solved       |
| 7.  | (a) farcical   | (b) remedial  | (c) plural     | (d) industrial   |
| 8.  | (a) quay       | (b) key       | (c) queue      | (d) keyed        |
| 9.  | (a) captured   | (b) captive   | (c) capture    | (d) captivity    |
| 10. | (a) leading    | (b) leaky     | (c) reeking    | (d) leaking      |
| 11. | (a) enthuse    | (b) enthuses  | (c) enthusiasm | (d) enthusiastic |
| 12. | (a) intimate   | (b) ultimate  | (c) consummate | (d) primate      |

# SPELLING

From <http://www.BreakingNewsEnglish.com/1606/160612-co2-emissions.html>

## Paragraph 1

1. deal with carbon iiodexd emissions
2. into valnoicc rock
3. It reacted with linrseam in the rock
4. a chalk-like solid scnutseab
5. the speed of the CO2 enovsorinc
6. all the scientists ionvvdel in the project

## Paragraph 2

7. a larger, more lditnsairu scale
8. help to laavielet the problem
9. become a key eqhneictu
10. carbon ceuprat and storage (CCS) solutions
11. Dr Matter was unastethisic
12. the ettumlai permanent storage

# PUT THE TEXT BACK TOGETHER

From <http://www.BreakingNewsEnglish.com/1606/160612-co2-emissions.html>

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

- ( ) to alleviate the problem of growing CO2 emissions entering the atmosphere and warming the
- ( **1** ) Scientists have come up with a smart but simple way to deal with carbon dioxide emissions, by turning them back
- ( ) the speed of the CO2 conversion. Lead scientist Juerg Matter said: "Of our 220 tons of injected CO2, 95
- ( ) per cent was converted to limestone in less than two years." He added: "It was a huge
- ( ) into stone. Researchers in Iceland pumped 220 tons of CO2 deep underground into volcanic rock. It reacted with
- ( ) substance similar to limestone. The team expressed their surprise at both the success and
- ( ) planet. It could also become a key technique in carbon capture and storage (CCS) solutions. Many other CCS
- ( ) emissions and this is the ultimate permanent storage – turn them back to stone."
- ( ) minerals in the rock and over a relatively short space of time, transformed into a chalk-like solid
- ( ) enthusiastic about his team's experiments. He said: "We need to deal with rising carbon
- ( ) of the emissions leaking their way back above ground and into the atmosphere. Dr Matter was
- ( ) surprise to all the scientists involved in the project, and we thought, 'Wow! This is really fast!'"
- ( ) The scientists hope their experiment will be adapted on a larger, more industrial scale. It could help
- ( ) techniques have involved injecting and trapping CO2 underground. However, there was always the problem

# PUT THE WORDS IN THE RIGHT ORDER

From <http://www.BreakingNewsEnglish.com/1606/160612-co2-emissions.html>

1. with way smart up carbon to but with dioxide deal simple a Come .
2. with in rock reacted minerals the It .
3. to limestone Transformed into a chalk- like solid substance similar .
4. in limestone to Converted years two than less .
5. surprise the It huge all involved a to scientists was .
6. hope scientists The adapted be will experiment their .
7. problem emissions of Alleviate growing the CO2 .
8. also could It capture carbon in technique key a become .
9. their above problem leaking back The emissions way ground of .
10. need to deal with rising carbon emissions We .

# CIRCLE THE CORRECT WORD (20 PAIRS)

From <http://www.BreakingNewsEnglish.com/1606/160612-co2-emissions.html>

Scientists have come *down / up* with a smart but simple way to deal *of / with* carbon dioxide emissions, by turning them back into stone. Researchers in Iceland *pumped / plumped* 220 tons of CO2 deep underground into volcanic rock. It *reacted / reaction* with minerals in the rock and over a relatively short *spatial / space* of time, transformed into a chalk-like solid substance similar to limestone. The team expressed their *surprising / surprise* at both the success and the speed of the CO2 *conversion / convert*. Lead scientist Juerg Matter said: "Of our 220 tons of *injection / injected* CO2, 95 per cent was converted to limestone in less than two years." He added: "It was a *huge / enormous* surprise to all the scientists *involving / involved* in the project, and we thought, 'Wow! This is really fast'."

The scientists hope their experiment will be adapted *on / in* a larger, more industrial scale. It could help to *alleviate / elucidate* the problem of growing CO2 emissions entering *the / an* atmosphere and warming *the / a* planet. It could also become a *key / lock* technique in carbon capture and storage (CCS) solutions. Many other CCS techniques have *involving / involved* injecting and trapping CO2 underground. However, there was always the problem of the emissions *leaked / leaking* their way back *above / higher* ground and into the atmosphere. Dr Matter was *enthusiastic / enthusiasm* about his team's experiments. He said: "We need to deal with rising carbon emissions and this is the ultimate *permanently / permanent* storage – turn them back to stone."

**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 <http://www.BreakingNewsEnglish.com/1606/160612-co2-emissions.html>

Sc\_\_nt\_\_sts h\_v\_\_c\_\_m\_\_p w\_th\_\_sm\_\_rt b\_t s\_mpl\_\_w\_\_y  
t\_\_d\_\_l w\_th c\_\_rb\_\_n d\_\_x\_\_d\_\_m\_\_ss\_\_ns, by t\_rn\_\_ng  
th\_\_m b\_\_ck\_\_nt\_\_st\_\_n\_\_. R\_s\_\_rch\_\_rs\_\_n\_\_c\_\_l\_\_nd p\_\_mp\_\_d  
220 t\_\_ns\_\_f\_\_C\_\_2 d\_\_p\_\_nd\_\_rgr\_\_nd\_\_nt\_\_v\_\_lc\_\_n\_\_c\_\_r\_\_ck.  
\_\_t\_\_r\_\_ct\_\_d w\_th m\_\_n\_\_r\_\_ls\_\_n\_\_th\_\_r\_\_ck\_\_nd\_\_v\_\_r\_\_  
r\_\_l\_\_t\_\_v\_\_ly sh\_\_rt sp\_\_c\_\_f\_\_t\_\_m\_\_, tr\_\_nsf\_\_rm\_\_d\_\_nt\_\_  
ch\_\_lk\_\_l\_\_k\_\_s\_\_l\_\_d\_\_s\_\_bst\_\_nc\_\_s\_\_m\_\_l\_\_r\_\_t\_\_l\_\_m\_\_st\_\_n\_\_. Th\_\_  
t\_\_m\_\_xpr\_\_ss\_\_d th\_\_r\_\_s\_\_rpr\_\_s\_\_t\_\_b\_\_th th\_\_s\_\_cc\_\_ss\_\_nd  
th\_\_sp\_\_d\_\_f\_\_th\_\_C\_\_2 c\_\_nv\_\_rs\_\_n. L\_\_d sc\_\_nt\_\_st J\_\_rg  
M\_\_tt\_\_r s\_\_d: "f\_\_r 220 t\_\_ns\_\_f\_\_nj\_\_ct\_\_d C\_\_2, 95 p\_\_r  
c\_\_nt w\_\_s c\_\_nv\_\_rt\_\_d t\_\_l\_\_m\_\_st\_\_n\_\_n\_\_l\_\_ss th\_\_n tw\_\_  
y\_\_rs." H\_\_dd\_\_d: "t\_\_w\_\_s\_\_h\_\_g\_\_s\_\_rpr\_\_s\_\_t\_\_ll th\_\_  
sc\_\_nt\_\_sts\_\_nv\_\_lv\_\_d\_\_n\_\_th\_\_pr\_\_j\_\_ct, \_\_nd w\_\_th\_\_ght,  
'W\_\_w! Th\_\_s\_\_s\_\_r\_\_lly f\_\_st'."

Th\_\_sc\_\_nt\_\_sts h\_\_p\_\_th\_\_r\_\_xp\_\_r\_\_m\_\_nt w\_\_ll b\_\_d\_\_pt\_\_d  
\_\_n\_\_l\_\_rg\_\_r, m\_\_r\_\_nd\_\_str\_\_l\_\_sc\_\_l\_\_. \_\_t\_\_c\_\_ld h\_\_lp t\_\_  
\_\_ll v\_\_t\_\_th\_\_pr\_\_bl\_\_m\_\_f\_\_gr\_\_w\_\_ng C\_\_2\_\_m\_\_ss\_\_ns  
\_\_nt\_\_r\_\_ng th\_\_tm\_\_sph\_\_r\_\_nd w\_\_rm\_\_ng th\_\_pl\_\_n\_\_t. \_\_t\_\_  
c\_\_ld\_\_ls\_\_b\_\_c\_\_m\_\_k\_\_y t\_\_chn\_\_q\_\_n\_\_c\_\_rb\_\_n c\_\_pt\_\_r\_\_  
\_\_nd st\_\_r\_\_g\_\_ (CCS) s\_\_l\_\_t\_\_ns. M\_\_ny\_\_th\_\_r\_\_CCS  
t\_\_chn\_\_q\_\_s h\_\_v\_\_nv\_\_lv\_\_d\_\_nj\_\_ct\_\_ng\_\_nd tr\_\_pp\_\_ng C\_\_2  
\_\_nd rgr\_\_nd. H\_\_w\_\_v\_\_r, th\_\_r\_\_w\_\_s\_\_lw\_\_ys th\_\_pr\_\_bl\_\_m  
\_\_f\_\_th\_\_m\_\_ss\_\_ns l\_\_k\_\_ng th\_\_r\_\_w\_\_y b\_\_ck\_\_b\_\_v\_\_  
gr\_\_nd\_\_nd\_\_nt\_\_th\_\_tm\_\_sph\_\_r\_\_. Dr M\_\_tt\_\_r w\_\_s  
\_\_nth\_\_s\_\_st\_\_c\_\_b\_\_t h\_\_s t\_\_m's\_\_xp\_\_r\_\_m\_\_nts. H\_\_s\_\_d:  
"W\_\_n\_\_d t\_\_d\_\_l w\_\_th r\_\_s\_\_ng c\_\_rb\_\_n\_\_m\_\_ss\_\_ns\_\_nd  
th\_\_s\_\_s th\_\_lt\_\_m\_\_t\_\_p\_\_rm\_\_n\_\_nt st\_\_r\_\_g\_\_- t\_\_rn th\_\_m  
b\_\_ck t\_\_st\_\_n\_\_."

# PUNCTUATE THE TEXT AND ADD CAPITALS

From <http://www.BreakingNewsEnglish.com/1606/160612-co2-emissions.html>

scientists have come up with a smart but simple way to deal with carbon dioxide emissions by turning them back into stone researchers in iceland pumped 220 tons of co2 deep underground into volcanic rock it reacted with minerals in the rock and over a relatively short space of time transformed into a chalk-like solid substance similar to limestone the team expressed their surprise at both the success and the speed of the co2 conversion lead scientist juerg matter said "of our 220 tons of injected co2 95 per cent was converted to limestone in less than two years" he added "it was a huge surprise to all the scientists involved in the project and we thought 'wow this is really fast'"

the scientists hope their experiment will be adapted on a larger more industrial scale it could help to alleviate the problem of growing co2 emissions entering the atmosphere and warming the planet it could also become a key technique in carbon capture and storage (ccs) solutions many other ccs techniques have involved injecting and trapping co2 underground however there was always the problem of the emissions leaking their way back above ground and into the atmosphere dr matter was enthusiastic about his team's experiments he said "we need to deal with rising carbon emissions and this is the ultimate permanent storage – turn them back to stone"

# PUT A SLASH ( / ) WHERE THE SPACES ARE

From <http://www.BreakingNewsEnglish.com/1606/160612-co2-emissions.html>

Scientists have come up with a smart but simple way to deal with carbon dioxide emissions, by turning them back into stone. Researchers in Iceland pumped 220 tons of CO<sub>2</sub> deep underground into volcanic rock. It reacts with minerals in the rock and over a relatively short space of time, transformed into a chalk-like solid substance similar to limestone. The team expressed their surprise at both the success and the speed of the CO<sub>2</sub> conversion. Lead scientist Juerg Matter said: "Of our 220 tons of injected CO<sub>2</sub>, 95 percent was converted to limestone in less than two years." He added: "It was a huge surprise to all the scientists involved in the project, and we thought, 'Wow! This is really fast'." The scientists hope their experiment will be adapted on a larger, more industrial scale. It could help to alleviate the problem of growing CO<sub>2</sub> emissions entering the atmosphere and warming the planet. It could also become a key technique in carbon capture and storage (CCS) solutions. Many other CCS techniques have involved injecting and trapping CO<sub>2</sub> underground. However, there was always the problem of the emissions leaking their way back above ground and into the atmosphere. Dr Matter was enthusiastic about his team's experiments. He said: "We need to deal with rising carbon emissions and this is the ultimate permanent storage – turn them back to stone."





# 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 CO<sub>2</sub>. Share what you discover with your partner(s) in the next lesson.

**3. GLOBAL WARMING:** Make a poster about global warming and how we can reduce it. Show your work to your classmates in the next lesson. Did you all have similar things?

**4. TURN TO STONE:** Write a magazine article about turning CO<sub>2</sub> into stone. Include imaginary interviews with people who think this is the answer to global warming, and with people who think it isn't.

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 CO<sub>2</sub>. Ask him/her three questions about CO<sub>2</sub>. Give him/her three of your ideas on what we can do every day to reduce our carbon footprint. Read your letter to your partner(s) in your next lesson. Your partner(s) will answer your questions.

# ANSWERS

## TRUE / FALSE (p.4)

a F    b F    c F    d T    e T    f T    g F    h T

## SYNONYM MATCH (p.4)

- |                 |                  |
|-----------------|------------------|
| 1. come up with | a. created       |
| 2. deal with    | b. handle        |
| 3. relatively   | c. comparatively |
| 4. conversion   | d. change        |
| 5. huge         | e. enormous      |
| 6. alleviate    | f. reduce        |
| 7. key          | g. crucial       |
| 8. leaking      | h. seeping (out) |
| 9. enthusiastic | i. passionate    |
| 10. ultimate    | j. greatest      |

## COMPREHENSION QUESTIONS (p.8)

1. 220 tons
2. Limestone
3. The speed
4. Less than two years
5. Wow
6. A larger, industrial scale
7. Carbon capture storage
8. Some of it leaked above ground
9. Enthusiastic
10. Ultimate permanent storage

## MULTIPLE CHOICE - QUIZ (p.9)

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

## ALL OTHER EXERCISES

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