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**Level 6** – 9th May, 2020

## Scientists say cold air rises

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

<https://breakingnewsenglish.com/2005/200509-cold-air.html>

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**Please try Levels 4 and 5 (they are easier).**

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# THE ARTICLE

From <https://breakingnewsenglish.com/2005/200509-cold-air.html>

Most of us learn at school that warm air rises and cool air sinks. This has always appeared to be a fundamental principle of science. However, a study from the University of California, Davis found that there are circumstances in which cool air rises. Researchers discovered that in tropical atmospheres, cold air rises because of the lightness of water vapour. Apparently, in warmer and more humid climates, water particles become more buoyant and can help cooler air rise. Lead researcher Dr Da Yang said: "Water vapour has a buoyancy effect which helps release the heat of the atmosphere to space and reduce the degree of warming. Without this lightness of water vapour, the climate warming would be even worse."

The scientists said humid air is lighter than dry air at the same temperatures and pressure. This is called the vapour buoyancy effect. It allows cooler air containing water droplets to rise, which then forms clouds and thunderstorms. The resulting rain has a cooling effect in tropical areas. Another researcher, Seth Seidel, said more research is needed to find out the effects rising cool air has on climate change, and on its impact on curbing the effects of global warming. Seth Seidel said: "Now that we understand how the lightness of water regulates tropical climate, we plan to study whether global climate models accurately represent this effect." The study is published in the journal "Science Advances".

Sources: <https://www.sciencedaily.com/releases/2020/05/200506162159.htm>  
<https://phys.org/news/2020-05-cold-air-riseswhat-earth-climate.html>  
<https://advances.sciencemag.org/content/6/19/eaba1951>

# WARM-UPS

**1. COLD AIR:** Students walk around the class and talk to other students about cold air. 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?

learn / warm air / fundamental / cool air / tropical / water vapour / buoyancy / climate scientists / temperature / pressure / clouds / thunderstorm / global warming / journal

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

**3. COOL AIR:** Students A **strongly** believe cool air is better than war air; Students B **strongly** believe the opposite. Change partners again and talk about your conversations.

**4. WEATHER:** What are the good and bad things about these types of waether? Complete this table with your partner(s). Change partners often and share what you wrote.

	Good Things	Bad Things
Rain		
Thunderstorms		
Heat		
Humidity		
Snow		
22°C sunshine		

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

**6. SCHOOL:** Rank these with your partner. Put the best school subjects at the top. Change partners often and share your rankings.

- Science
- Religion
- History
- English
- Sports
- Maths
- Literature
- Art

# VOCABULARY MATCHING

## Paragraph 1

- |                  |                                                                                                         |
|------------------|---------------------------------------------------------------------------------------------------------|
| 1. sink          | a. Being a necessary base or core; of central importance.                                               |
| 2. fundamental   | b. Events or facts that cause or help to cause something to happen.                                     |
| 3. principle     | c. Go down below the surface of something, especially of a liquid.                                      |
| 4. circumstances | d. A tiny, tiny bit of matter.                                                                          |
| 5. vapour        | e. A gassy, watery substance.                                                                           |
| 6. particle      | f. The ability or tendency to float in water or air or some other fluid.                                |
| 7. buoyancy      | g. A basic truth that is the foundation for a system of belief or behavior or for a chain of reasoning. |

## Paragraph 2

- |                |                                                                                                |
|----------------|------------------------------------------------------------------------------------------------|
| 8. pressure    | h. A newspaper or magazine that deals with a particular subject or professional activity.      |
| 9. droplet     | i. Control or maintain the rate or speed of a machine or process so that it operates properly. |
| 10. curbing    | j. In a way that is correct in all details.                                                    |
| 11. regulate   | k. Continuous physical force exerted on or against an object by something in contact with it.  |
| 12. accurately | l. A very small drop of a liquid.                                                              |
| 13. represent  | m. Be a specimen or example of; typify.                                                        |
| 14. journal    | n. Restraining or keeping in check.                                                            |

# BEFORE READING / LISTENING

From <https://breakingnewsenglish.com/2005/200509-cold-air.html>

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

- a. Few of us learn at school that warm air rises. **T / F**
- b. There is a study from the University of Davis, California. **T / F**
- c. Cold air rises because of the lightness of water vapour. **T / F**
- d. Climate change could be worse if cool air didn't rise. **T / F**
- e. Dry air is lighter than humid air. **T / F**
- f. Rising cool air helps to form thunderstorms and clouds. **T / F**
- g. A researcher said more research is needed on warm and hot air. **T / F**
- h. The research is published in the journal "Advances Science". **T / F**

## 2. SYNONYM MATCH:

Match the following synonyms. The words in **bold** are from the news article.

- |                         |                |
|-------------------------|----------------|
| <b>1. sinks</b>         | a. including   |
| <b>2. circumstances</b> | b. evidently   |
| <b>3. apparently</b>    | c. outcome     |
| <b>4. vapour</b>        | d. precisely   |
| <b>5. release</b>       | e. moisture    |
| <b>6. effect</b>        | f. descends    |
| <b>7. containing</b>    | g. controls    |
| <b>8. curbing</b>       | h. set free    |
| <b>9. regulates</b>     | i. situations  |
| <b>10. accurately</b>   | j. restraining |

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

- |                                             |                             |
|---------------------------------------------|-----------------------------|
| 1. Most of us learn at school that warm air | a. and pressure             |
| 2. a fundamental principle                  | b. which cool air rises     |
| 3. there are circumstances in               | c. the effects              |
| 4. Water vapour has a buoyancy              | d. worse                    |
| 5. climate warming would be even            | e. and thunderstorms        |
| 6. dry air at the same temperatures         | f. of science               |
| 7. forms clouds                             | g. in tropical areas        |
| 8. The resulting rain has a cooling effect  | h. effect                   |
| 9. its impact on curbing                    | i. the journal              |
| 10. The study is published in               | j. rises and cool air sinks |

# GAP FILL

From <https://breakingnewsenglish.com/2005/200509-cold-air.html>

Most of us learn at school that warm air rises and cool air (1) \_\_\_\_\_. This has always appeared to be a fundamental principle of science. However, a (2) \_\_\_\_\_ from the University of California, Davis found that there are circumstances in which cool air rises. Researchers discovered that in (3) \_\_\_\_\_ atmospheres, cold air rises because of the lightness of water (4) \_\_\_\_\_. Apparently, in warmer and more humid climates, water particles become more (5) \_\_\_\_\_ and can help cooler air rise. Lead researcher Dr Da Yang said: "Water vapour has a buoyancy (6) \_\_\_\_\_ which helps release the heat of the atmosphere to space and reduce the (7) \_\_\_\_\_ of warming. Without this lightness of water vapour, the climate warming would be (8) \_\_\_\_\_ worse."

*study*  
*effect*  
*vapour*  
*even*  
*sinks*  
*degree*  
*tropical*  
*buoyant*

The scientists said (9) \_\_\_\_\_ air is lighter than dry air at the same temperatures and pressure. This is called the vapour buoyancy effect. It (10) \_\_\_\_\_ cooler air containing water droplets to rise, which then forms (11) \_\_\_\_\_ and thunderstorms. The resulting rain has a cooling effect in tropical areas. Another researcher, Seth Seidel, said more (12) \_\_\_\_\_ is needed to find out the effects rising cool air has on climate change, and on its impact on (13) \_\_\_\_\_ the effects of global warming. Seth Seidel said: "Now that we understand how the (14) \_\_\_\_\_ of water regulates tropical climate, we plan to study whether global climate models (15) \_\_\_\_\_ represent this effect." The study is published in the (16) \_\_\_\_\_ "Science Advances".

*clouds*  
*curbing*  
*journal*  
*humid*  
*accurately*  
*research*  
*allows*  
*lightness*

# LISTENING – Guess the answers. Listen to check.

From <https://breakingnewsenglish.com/2005/200509-cold-air.html>

- 1) Most of us learn at school that warm air rises and \_\_\_\_\_
  - a. cool air sinks
  - b. cool air stinks
  - c. cool air slinks
  - d. cool air shrinks
- 2) This has always appeared to be a fundamental \_\_\_\_\_
  - a. principle of science
  - b. principal of science
  - c. prince apple of science
  - d. principlalty of science
- 3) Researchers discovered that \_\_\_\_\_
  - a. in tropic atmospheres
  - b. in topical atmospheres
  - c. in trippy call atmospheres
  - d. in trope call atmospheres
- 4) in warmer and more humid climates, water particles \_\_\_\_\_
  - a. become more buoy aunt
  - b. become more boy aunt
  - c. become more boy ant
  - d. become more buoyant
- 5) Without this lightness of water vapour, the climate warming would \_\_\_\_\_
  - a. be even worst
  - b. be even verse
  - c. be even worth
  - d. be even worse
- 6) humid air is lighter than dry air at the same \_\_\_\_\_
  - a. temperatures and pressured
  - b. temperature and pressured
  - c. temperatures and pressure
  - d. temp raters and pressure
- 7) It allows cooler air containing water \_\_\_\_\_
  - a. droplets to rise
  - b. droplets to arise
  - c. droplets to risen
  - d. droplets to riser
- 8) more research is needed to find out the effects \_\_\_\_\_ has
  - a. rising cool lair
  - b. rising coo lair
  - c. rising cool ear
  - d. rising cool air
- 9) Now that we understand how the lightness of water \_\_\_\_\_
  - a. deregulates tropical climate
  - b. aggregates tropical climate
  - c. surrogates tropical climate
  - d. regulates tropical climate
- 10) we plan to study whether global climate models accurately \_\_\_\_\_
  - a. represent this reflect
  - b. represent this effect
  - c. represent this affect
  - d. represent this confect

# LISTENING – Listen and fill in the gaps

From <https://breakingnewsenglish.com/2005/200509-cold-air.html>

Most of us learn at school that warm air (1) \_\_\_\_\_ air sinks. This has always appeared to be a fundamental (2) \_\_\_\_\_. However, a study from the University of California, Davis found that there are circumstances in which cool air rises. Researchers discovered that in tropical atmospheres, cold air rises because of the (3) \_\_\_\_\_ vapour. Apparently, in warmer and more humid climates, water particles become (4) \_\_\_\_\_ can help cooler air rise. Lead researcher Dr Da Yang said: "Water vapour has a buoyancy effect which helps release (5) \_\_\_\_\_ the atmosphere to space and reduce the degree of warming. Without this lightness of water vapour, (6) \_\_\_\_\_ would be even worse."

The scientists said humid (7) \_\_\_\_\_ than dry air at the same temperatures and pressure. This is called (8) \_\_\_\_\_ effect. It allows cooler air containing water (9) \_\_\_\_\_, which then forms clouds and thunderstorms. The resulting rain has a cooling effect in tropical areas. Another researcher, Seth Seidel, said more research is needed to find (10) \_\_\_\_\_ rising cool air has on climate change, and on its impact on curbing the effects of global warming. Seth Seidel said: "Now that we understand how the lightness of water (11) \_\_\_\_\_, we plan to study whether global climate models accurately represent this effect." The study (12) \_\_\_\_\_ the journal "Science Advances".



# COMPREHENSION QUESTIONS

From <https://breakingnewsenglish.com/2005/200509-cold-air.html>

1. Where do most of us learn that warm air rises?
2. In what kind of atmospheres does cool air rise?
3. What becomes more buoyant in more humid climates?
4. Who is Da Yang?
5. What could be worse without the lightness of water vapour?
6. What did scientists say was lighter than dry air?
7. What does air with water droplets help to form?
8. What did a researcher called Seth Seidel say was needed?
9. What models did a researcher plan to study?
10. What is the name of the study the article is published in?

# MULTIPLE CHOICE - QUIZ

From <https://breakingnewsenglish.com/2005/200509-cold-air.html>

- 1) Where do most of us learn that warm air rises?
  - a) on the Internet
  - b) in the bathroom
  - c) in nature
  - d) at school
- 2) In what kind of atmospheres does cool air rise?
  - a) bad atmospheres
  - b) tropical atmospheres
  - c) space atmospheres
  - d) hemispheres
- 3) What becomes more buoyant in more humid climates?
  - a) heat
  - b) oxygen
  - c) water particles
  - d) rain
- 4) Who is Da Yang?
  - a) a lead researcher
  - b) a journalist
  - c) a publisher
  - d) a student
- 5) What could be worse without the lightness of water vapour?
  - a) flooding
  - b) typhoons
  - c) climate warming
  - d) floods
- 6) What did scientists say was lighter than dry air?
  - a) oxygen
  - b) humid air
  - c) CO<sub>2</sub>
  - d) pollution
- 7) What does air with water droplets help to form?
  - a) waterfalls
  - b) hurricanes
  - c) flooding
  - d) clouds and thunderstorms
- 8) What did a researcher called Seth Seidel say was needed?
  - a) more research
  - b) more rain
  - c) more money
  - d) less pollution
- 9) What models did a researcher plan to study?
  - a) geothermal science models
  - b) rain pattern models
  - c) global climate models
  - d) toy models
- 10) What is the name of the study the article is published in?
  - a) Climate Changes
  - b) Science Advances
  - c) Water Advances
  - d) Clouds and Thunderstorms

# ROLE PLAY

From <https://breakingnewsenglish.com/2005/200509-cold-air.html>

## **Role A – Science**

You think science is the best subject to study at school. Tell the others three reasons why. Tell them what is wrong with their subjects. Also, tell the others which is the least interesting of these (and why): literature, art or maths.

## **Role B – Literature**

You think literature is the best subject to study at school. Tell the others three reasons why. Tell them what is wrong with their subjects. Also, tell the others which is the least interesting of these (and why): science, art or maths.

## **Role C – Art**

You think art is the best subject to study at school. Tell the others three reasons why. Tell them what is wrong with their subjects. Also, tell the others which is the least interesting of these (and why): literature, science or maths.

## **Role D – Maths**

You think maths is the best subject to study at school. Tell the others three reasons why. Tell them what is wrong with their subjects. Also, tell the others which is the least interesting of these (and why): literature, art or science.

# AFTER READING / LISTENING

From <https://breakingnewsenglish.com/2005/200509-cold-air.html>

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

<b>cold</b>	<b>air</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>• learn</li><li>• principle</li><li>• discovered</li><li>• lead</li><li>• release</li><li>• worse</li></ul>	<ul style="list-style-type: none"><li>• dry</li><li>• allows</li><li>• resulting</li><li>• curbing</li><li>• whether</li><li>• published</li></ul>
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# COLD AIR SURVEY

From <https://breakingnewsenglish.com/2005/200509-cold-air.html>

Write five GOOD questions about cold air 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.

# COLD AIR 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 'cold'?
3. What do you think of cold air?
4. What did you learn about air at school?
5. What did you think of science at school?
6. What do you know about tropical areas?
7. What are the good and bad things about the tropics?
8. What do you think of humidity?
9. What kind of weather do you love?
10. What do you know about global warming?

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# COLD AIR 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 'air'?
13. What do you think about what you read?
14. What is your favourite outside temperature and why?
15. What do you think the vapour buoyancy effect is?
16. What do you think of thunderstorms?
17. How could we curb the effects of global warming?
18. How much do you like science?
19. What would it be like to be a scientist?
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/2005/200509-cold-air.html>

Most of us learn at school that warm air rises and cool air sinks. This has always appeared to be a fundamental (1) \_\_\_\_\_ of science. However, a study from the University of California, Davis found that there are circumstances (2) \_\_\_\_\_ which cool air rises. Researchers discovered that in tropical atmospheres, cold air rises because of the (3) \_\_\_\_\_ of water vapour. Apparently, in warmer and more humid climates, water (4) \_\_\_\_\_ become more buoyant and can help cooler air rise. Lead researcher Dr Da Yang said: "Water vapour has a buoyancy effect which helps (5) \_\_\_\_\_ the heat of the atmosphere to space and reduce the degree of warming. Without this lightness of water vapour, the climate warming would be (6) \_\_\_\_\_ worse."

The scientists said humid air is lighter than (7) \_\_\_\_\_ air at the same temperatures and pressure. This is called the vapour buoyancy effect. It allows cooler air containing water droplets to rise, which then (8) \_\_\_\_\_ clouds and thunderstorms. The resulting rain has a cooling effect in tropical areas. Another researcher, Seth Seidel, said more research is needed to find out the effects rising cool air has on climate change, and on its impact on (9) \_\_\_\_\_ the effects of global warming. Seth Seidel said: "Now that we understand how the lightness of water (10) \_\_\_\_\_ tropical climate, we plan to study (11) \_\_\_\_\_ global climate models accurately represent this effect." The study is published in the (12) \_\_\_\_\_ "Science Advances".

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

- |     |                 |                  |                |                 |
|-----|-----------------|------------------|----------------|-----------------|
| 1.  | (a) principal   | (b) principality | (c) principle  | (d) principles  |
| 2.  | (a) in          | (b) as           | (c) though     | (d) much        |
| 3.  | (a) lightness   | (b) weighty      | (c) float      | (d) buoyant     |
| 4.  | (a) particles   | (b) particulars  | (c) partitions | (d) parts       |
| 5.  | (a) freedom     | (b) release      | (c) jettison   | (d) propel      |
| 6.  | (a) ever        | (b) event        | (c) every      | (d) even        |
| 7.  | (a) fried       | (b) levelled     | (c) dry        | (d) toxicity    |
| 8.  | (a) ups         | (b) adds         | (c) bakes      | (d) forms       |
| 9.  | (a) curbing     | (b) craving      | (c) curving    | (d) cubing      |
| 10. | (a) deregulates | (b) regulates    | (c) irrigates  | (d) radiates    |
| 11. | (a) whither     | (b) whether      | (c) whiter     | (d) whatever    |
| 12. | (a) manual      | (b) précis       | (c) journal    | (d) white paper |



# SPELLING

From <https://breakingnewsenglish.com/2005/200509-cold-air.html>

## Paragraph 1

1. a fundamental ripnipcel of science
2. there are acussemrtcni
3. in tropical eoephssrmat
4. water particles become more notaybu
5. reduce the geeedr of warming
6. Without this lightness of water opauvr

## Paragraph 2

7. hdimu air is lighter
8. at the same temperatures and esrrspue
9. water strledop
10. ngbicur the effects of global warming
11. water teugersal tropical climate
12. published in the anjrlou "Science Advances"

# PUT THE TEXT BACK TOGETHER

From <https://breakingnewsenglish.com/2005/200509-cold-air.html>

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

- ( ) on curbing the effects of global warming. Seth Seidel said: "Now that we understand how the lightness of water regulates tropical
- ( ) effect which helps release the heat of the atmosphere to space and reduce the degree
- ( ) effect. It allows cooler air containing water droplets to rise, which then forms clouds and thunderstorms. The resulting rain has
- ( ) rises because of the lightness of water vapour. Apparently, in warmer and more humid climates, water
- ( ) The scientists said humid air is lighter than dry air at the same temperatures and pressure. This is called the vapour buoyancy
- ( **1** ) Most of us learn at school that warm air rises and cool air sinks. This has always appeared to be a fundamental
- ( ) this effect." The study is published in the journal "Science Advances".
- ( ) climate, we plan to study whether global climate models accurately represent
- ( ) of warming. Without this lightness of water vapour, the climate warming would be even worse."
- ( ) a cooling effect in tropical areas. Another researcher, Seth Seidel, said more research is needed to
- ( ) particles become more buoyant and can help cooler air rise. Lead researcher Dr Da Yang said: "Water vapour has a buoyancy
- ( ) find out the effects rising cool air has on climate change, and on its impact
- ( ) principle of science. However, a study from the University of California, Davis found that there are
- ( ) circumstances in which cool air rises. Researchers discovered that in tropical atmospheres, cold

# PUT THE WORDS IN THE RIGHT ORDER

From <https://breakingnewsenglish.com/2005/200509-cold-air.html>

1. that We rises . learn air warm at school
2. in which rises . are circumstances air cool There
3. water . because rises lightness of Air of the
4. atmosphere the Release space . heat to the of
5. climate be The even would worse . warming
6. than dry Humid lighter air . air is
7. the buoyancy effect . vapour called is This
8. has in cooling effect a tropical Rain areas .
9. air Find has . cool the effects out rising
10. models climate effect . Global represent this accurately

# CIRCLE THE CORRECT WORD (20 PAIRS)

From <https://breakingnewsenglish.com/2005/200509-cold-air.html>

Most of us *learn / academic* at school that warm air rises and cool air sinks. This has always *seemingly / appeared* to be a fundamental principle of science. However, a *studious / study* from the University of California, Davis found that there are circumstances *in / on* which cool air rises. Researchers discovered that in *tropics / tropical* atmospheres, cold air rises because of the lightness of water *wiper / vapour*. Apparently, in warmer and more humid climates, water particles become more *buoyant / floating* and can help cooler air rise. Lead researcher Dr Da Yang said: "Water vapour has a buoyancy *reflect / effect* which helps release the heat of the atmosphere to space and reduce the *degree / agree* of warming. Without this lightness of water vapour, the climate warming would be even *worst / worse*."

The scientists said *humid / humidity* air is lighter than dry air at the same temperatures and pressure. This is called the vapour buoyancy *affect / effect*. It allows cooler air *contents / containing* water droplets to rise, which then forms clouds and *thunderstorms / thundery*. The resulting rain has a cooling effect in tropical areas. Another researcher, Seth Seidel, said more research is needed to find out the effects rising cool air *have / has* on climate change, and on its impact on *craving / curbing* the effects of global warming. Seth Seidel said: "Now that we understand how the lightness of water *regulates / waters* tropical climate, we plan to study *weather / whether* global climate models accurately *system / represent* this effect." The study is published in the *journal / journey* "Science Advances".

**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/2005/200509-cold-air.html>

M\_s t \_f \_s l\_\_ r n \_t s c h\_\_ l t h\_t w\_r m \_\_ r  
r\_s\_s \_n d c\_\_ l \_\_ r s\_n k s . T h\_s h\_s \_l w\_y s  
\_p p\_\_ r\_d t\_ b\_\_ \_f\_n d\_m\_n t\_l p\_r\_n c\_p\_l \_f s c\_\_  
n c\_ . H\_w\_v\_r , \_ s t\_d y f\_r\_m t\_h U\_n\_v\_r s\_t y \_f  
C\_l\_f\_r n\_\_ , D\_v\_s f\_\_ n d t\_h\_t t\_h\_r \_r\_ c\_r c\_m s  
t\_n c\_s \_n w\_h\_c h c\_\_ l \_\_ r r\_s\_s . R\_s\_\_ r c\_h\_r s  
d\_s c\_v\_r\_d t\_h\_t \_n t\_r\_p\_c\_l \_t m\_s p\_h\_r\_s , c\_l\_d  
\_\_ r r\_s\_s b\_c\_\_ s \_f t\_h l\_g h t n\_s s \_f w\_t\_r  
v\_p\_ \_ r . A p p\_r\_n t\_l y , \_n w\_r m\_r \_n d m\_r\_  
h\_m\_d c\_l\_m\_t\_s , w\_t\_r p\_r t\_c\_l\_s b\_c\_m\_ m\_r\_  
b\_\_ y\_n t \_n d c\_n h\_l p c\_\_ l\_r \_\_ r r\_s\_ . L\_\_ d  
r\_s\_\_ r c\_h\_r D\_r D\_ Y\_n g s\_\_ d : " W\_t\_r v\_p\_ \_ r  
h\_s \_ b\_\_ y\_n c\_y \_f f\_c t w\_h\_c h h\_l p\_s r\_l\_\_ s\_ t  
h\_ h\_\_ t \_f t\_h \_t m\_s p\_h\_r\_ t\_ s p\_c\_ \_n d r\_d\_c\_ t  
h\_ d\_g r\_\_ \_f w\_r m\_n g . W\_t h\_\_ t t\_h\_s l\_g h t n\_s  
s \_f w\_t\_r v\_p\_ \_ r , t\_h c\_l\_m\_t\_ w\_r m\_n g w\_\_ l  
d b\_ \_v\_n w\_r s\_ . "

T h\_ s c\_\_ n t\_s t\_s s\_\_ d h\_m\_d \_\_ r \_s l\_g h t\_r t  
h\_n d\_r y \_\_ r \_t t\_h s\_m\_ t\_m p\_r\_t\_r\_s \_n d p\_r\_s  
s\_r\_ . T h\_s \_s c\_l\_l\_d t\_h v\_p\_ \_ r b\_\_ y\_n c\_y \_f  
f\_c t . I t \_l\_l\_w\_s c\_\_ l\_r \_\_ r c\_n t\_\_ n\_n g w\_t\_r  
d\_r\_p\_l\_t\_s t\_ r\_s\_ , w\_h\_c h t\_h\_n f\_r m\_s c\_l\_\_ d\_s  
\_n d t\_h\_n d\_r s\_t\_r m\_s . T h\_ r\_s\_l\_t\_n g r\_\_ n h\_s  
\_ c\_\_ l\_n g \_f f\_c t \_n t\_r\_p\_c\_l \_r\_\_ s . A n\_t h\_r  
r\_s\_\_ r c\_h\_r , S\_t h S\_\_ d\_l , s\_\_ d m\_r\_ r\_s\_\_ r c\_h  
\_s n\_\_ d\_d t\_ f\_n d \_\_ t t\_h \_f f\_c t\_s r\_s\_n g c\_\_  
l \_\_ r h\_s \_n c\_l\_m\_t\_ c\_h\_n g\_ , \_n d \_n \_t\_s \_m p\_c  
t \_n c\_r b\_n g t\_h \_f f\_c t\_s \_f g\_l\_b\_l w\_r m\_n g .  
S\_t h S\_\_ d\_l s\_\_ d : " N\_w t\_h\_t w\_\_ n d\_r s\_t\_n d  
h\_w t\_h l\_g h t n\_s s \_f w\_t\_r r\_g\_l\_t\_s t\_r\_p\_c\_l  
c\_l\_m\_t\_ , w\_ p\_l\_n t\_ s\_t\_d y w\_h\_t h\_r g\_l\_b\_l c  
l\_m\_t\_ m\_d\_l\_s \_c c\_r\_t\_l\_y r\_p\_r\_s\_n t t\_h\_s \_f f\_c t .  
" T h\_ s t\_d y \_s p\_b\_l\_s h\_d \_n t\_h j\_\_ r\_n\_l " S  
c\_\_ n c\_ A d v\_n c\_s " .

# PUNCTUATE THE TEXT AND ADD CAPITALS

From <https://breakingnewsenglish.com/2005/200509-cold-air.html>

most of us learn at school that warm air rises and cool air sinks this has always appeared to be a fundamental principle of science however a study from the university of california davis found that there are circumstances in which cool air rises researchers discovered that in tropical atmospheres cold air rises because of the lightness of water vapour apparently in warmer and more humid climates water particles become more buoyant and can help cooler air rise lead researcher dr da yang said water vapour has a buoyancy effect which helps release the heat of the atmosphere to space and reduce the degree of warming without this lightness of water vapour the climate warming would be even worse

the scientists said humid air is lighter than dry air at the same temperatures and pressure this is called the vapour buoyancy effect it allows cooler air containing water droplets to rise which then forms clouds and thunderstorms the resulting rain has a cooling effect in tropical areas another researcher seth seidel said more research is needed to find out the effects rising cool air has on climate change and on its impact on curbing the effects of global warming seth seidel said now that we understand how the lightness of water regulates tropical climate we plan to study whether global climate models accurately represent this effect the study is published in the journal science advances

# PUT A SLASH ( / ) WHERE THE SPACES ARE

From <https://breakingnewsenglish.com/2005/200509-cold-air.html>

Most of us learn at school that warm air rises and cool air sinks. This has always appeared to be a fundamental principle of science. However, a study from the University of California, Davis found that there are circumstances in which cool air rises. Researchers discovered that in tropical atmospheres, cold air rises because of the lightness of water vapour. Apparently, in warmer and more humid climates, water particles become more buoyant and can help cooler air rise. Lead researcher Dr Da Yang said: "Water vapour has a buoyancy effect which helps release the heat of the atmosphere to space and reduces the degree of warming. Without this lightness of water vapour, the climate warming would be even worse." The scientist said humid air is lighter than dry air at the same temperatures and pressure. This is called the vapour buoyancy effect. It allows cooler air containing water droplets to rise, which then forms clouds and thunderstorms. The resulting rain has a cooling effect in tropical areas. Another researcher, Seth Seidel, said more research is needed to find out the effects of rising cool air on climate change, and on its impact on curbing the effects of global warming. Seth Seidel said: "Now that we understand how the lightness of water regulates tropical climate, we plan to study whether global climate models accurately represent this effect." The study is published in the journal "Science Advances".







# 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. COLD AIR:** Make a poster about cold air. Show your work to your classmates in the next lesson. Did you all have similar things?

**4. GLOBAL WARMING:** Write a magazine article about creating more cold air to help reduce global warming. 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 cold air. Ask him/her three questions about cold air. Give him/her three of your ideas. Read your letter to your partner(s) in your next lesson. Your partner(s) will answer your questions.

# ANSWERS

## VOCABULARY (p.4)

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

## TRUE / FALSE (p.5)

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

## SYNONYM MATCH (p.5)

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

## COMPREHENSION QUESTIONS (p.9)

1. At school
2. Tropical atmospheres
3. Water particles
4. The lead researcher
5. Climate warming
6. Humid air
7. Clouds and thunderstorms
8. More research
9. Global climate models
10. Science Advances

## WORDS IN THE RIGHT ORDER (p.20)

1. We learn at school that warm air rises.
2. There are circumstances in which cool air rises.
3. Air rises because of the lightness of water.
4. Release the heat of the atmosphere to space.
5. The climate warming would be even worse.
6. Humid air is lighter than dry air.
7. This is called the vapour buoyancy effect.
8. Rain has a cooling effect in tropical areas.
9. Find out the effects rising cool air has.
10. Global climate models accurately represent this effect.

## MULTIPLE CHOICE - QUIZ (p.10)

1. d    2. b    3. c    4. a    5. c    6. b    7. d    8. a    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 ;-)