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Level 6 – 27th November 2023

Bacteria pass 'memories' to future generations

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<https://breakingnewsenglish.com/2311/231127-bacteria-memories.html>

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

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THE ARTICLE

From <https://breakingnewsenglish.com/2311/231127-bacteria-memories.html>

Just when scientists thought they knew all there was to know about bacteria, they have unearthed something quite unexpected. They have found that bacteria have a mechanism within their single-celled forms that can store and pass on memories to future generations. The research was on the ubiquitous E. coli bacterium. This is one of Earth's most well-studied organisms. Researchers at the University of Texas wrote about how bacteria could form memories while lacking a brain: "Bacteria don't have brains, but they can gather information from their environment, and if they have encountered that environment frequently, they can store it and quickly access it later for their benefit."

Bacterial memory differs from that in humans. It may be more akin to our muscle memory. Our bodily tissue has a sense of what to do next from having done it repetitively many times before. The researchers attributed bacterial memory to levels of iron in their physical constitution. A researcher said: "Before there was oxygen in the Earth's atmosphere, early life was utilizing iron for a lot of cellular processes." He added: "Iron is not only critical in the origin of life on Earth, but also in the evolution of life. It makes sense that cells would utilize it." He said his research could aid in combating bacterial diseases, as "the more we know about bacterial behaviour, the easier it is to combat them".

Sources: <https://www.earth.com/news/bacteria-form-memories-and-pass-them-on-to-future-generations/>
<https://www.unilad.com/technology/space/whats-inside-earth-core-696460-20231123>
<https://www.sciencealert.com/in-a-first-bacteria-seen-storing-memories-and-passing-them-on-for-generations>

WARM-UPS

1. MEMORY: Students walk around the class and talk to other students about memory. 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 / bacteria / mechanism / single-celled forms / research / memories / brain / humans / muscle / sense / iron / physical / constitution / oxygen / Earth / diseases

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

3. MOST IMPORTANT: Students A **strongly** believe memories are the most important things we have; Students B **strongly** believe otherwise. Change partners again and talk about your conversations.

4. MEMORIES: Complete this table with your partner(s). Change partners and share what you wrote often.

Memories of...	Best Memories	Worst Memories
Elementary school		
English lessons		
Using a computer		
Shopping		
Holidays		
Something unexpected		

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

6. FUTURE GENERATIONS: Rank these with your partner. Put the most important things to pass on to future generations at the top. Change partners often and share your rankings.

- Memories
- Property
- Photos
- Money
- Jewellery
- Stories
- Knowledge
- Cleaner cities

VOCABULARY MATCHING

Paragraph 1

- | | |
|----------------|---|
| 1. unearthed | a. A natural or established process by which something takes place or is brought about. |
| 2. unexpected | b. Of a quality that is absent; not available or in short supply. |
| 3. mechanism | c. Discovered something hidden, lost, or kept secret by investigation or searching. |
| 4. ubiquitous | d. Not regarded as likely to happen. |
| 5. organism | e. Present, appearing, or found everywhere. |
| 6. lacking | f. An individual animal, plant, or single-celled life form. |
| 7. encountered | g. Unexpectedly be faced with or experience something hostile or difficult. |

Paragraph 2

- | | |
|------------------|--|
| 8. differ | h. Making practical and effective use of. |
| 9. akin | i. Be unlike or dissimilar. |
| 10. attributed | j. A person's or creature's physical state as regards energy, health, and strength. |
| 11. constitution | k. Having a decisive or crucial importance in the success, failure, or existence of something. |
| 12. utilizing | l. Of similar character. |
| 13. critical | m. Take action to reduce or prevent something bad or undesirable. |
| 14. combat | n. Regard something as being caused by. |

BEFORE READING / LISTENING

From <https://breakingnewsenglish.com/2311/231127-bacteria-memories.html>

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

1. Scientists actually know everything there is to know about bacteria. **T / F**
2. The most well-studied bacteria on Earth are E. coli. **T / F**
3. The researchers said some cells may have a brain. **T / F**
4. Bacteria can gather information about their environment. **T / F**
5. Bacteria memory could be similar to muscle memory in humans. **T / F**
6. Early bacteria relied on iron to develop and survive. **T / F**
7. Iron was important is the beginnings of life on Earth. **T / F**
8. A researcher said his research would end all diseases. **T / F**

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

- | | |
|-----------------------|------------------|
| 1. unearthed | a. similar |
| 2. unexpected | b. being without |
| 3. ubiquitous | c. experienced |
| 4. lacking | d. development |
| 5. encountered | e. unpredicted |
| 6. differs | f. credited |
| 7. akin | g. discovered |
| 8. attributed | h. fight |
| 9. evolution | i. varies |
| 10. combat | j. ever-present |

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

- | | |
|---|------------------------------|
| 1. they knew all | a. akin to our muscle memory |
| 2. they have unearthed something | b. E. coli bacterium |
| 3. The research was on the ubiquitous | c. access it later |
| 4. bacteria could form memories while | d. of life |
| 5. they can store it and quickly | e. the Earth's atmosphere |
| 6. Bacterial memory differs from | f. quite unexpected |
| 7. It may be more | g. that in humans |
| 8. Before there was oxygen in | h. lacking a brain |
| 9. in the evolution | i. bacterial diseases |
| 10. He said his research could aid in combating | j. there was to know |

GAP FILL

From <https://breakingnewsenglish.com/2311/231127-bacteria-memories.html>

Just when scientists thought they knew all there was to know about bacteria, they have (1) _____ something quite unexpected. They have found that bacteria have a (2) _____ within their (3) _____ -celled forms that can store and pass on memories to future generations. The research was on the (4) _____ E. coli bacterium. This is one of Earth's most well-studied (5) _____. Researchers at the University of Texas wrote about how bacteria could form memories while (6) _____ a brain: "Bacteria don't have brains, but they can (7) _____ information from their environment, and if they have encountered that environment frequently, they can store it and quickly (8) _____ it later for their benefit."

mechanism
ubiquitous
lacking
unearthed
access
single
gather
organisms

Bacterial memory (9) _____ from that in humans. It may be more akin to our (10) _____ memory. Our bodily tissue has a sense of what to do next from having done it repetitively many times before. The researchers (11) _____ bacterial memory to levels of iron in their physical (12) _____. A researcher said: "Before there was oxygen in the Earth's atmosphere, early life was (13) _____ iron for a lot of cellular processes." He added: "Iron is not only critical in the (14) _____ of life on Earth, but also in the evolution of life. It makes (15) _____ that cells would utilize it." He said his research could aid in (16) _____ bacterial diseases, as "the more we know about bacterial behaviour, the easier it is to combat them".

utilizing
attributed
sense
differs
origin
muscle
constitution
combating

LISTENING – Guess the answers. Listen to check.

From <https://breakingnewsenglish.com/2311/231127-bacteria-memories.html>

- 1) thought they knew all there was to know about bacteria, they _____
 - a. have earthed something
 - b. have in earthed something
 - c. have unearthed something
 - d. have nerved something
- 2) They have found that bacteria have a mechanism within their _____
 - a. single-sell forms
 - b. single-sold forms
 - c. single-cold forms
 - d. single-celled forms
- 3) wrote about how bacteria could form memories while _____
 - a. slacking a brain
 - b. lacking a brain
 - c. lacking the brain
 - d. lacking a brainy
- 4) information from their environment, and if they have encountered _____
 - a. that environment friendly
 - b. that environment frequently
 - c. that environment frequented
 - d. that environment frequency
- 5) they can store it and quickly access it later _____
 - a. for their benefit
 - b. for their beneficial
 - c. for their Benny fit
 - d. for their bona fide
- 6) It may be more akin to _____
 - a. our muscle memory
 - b. hour muscle memory
 - c. our muscle memorial
 - d. our muscular memorial
- 7) Our bodily tissue has a sense of what to do next from having _____
 - a. done it repetitively
 - b. done it repetitive
 - c. done it repeated lively
 - d. done it repeat it lively
- 8) researchers attributed bacterial memory to levels of iron in _____
 - a. their physical constipation
 - b. their physical constituent
 - c. their physical construction
 - d. their physical constitution
- 9) early life was utilizing iron for a lot _____
 - a. of cellular process is
 - b. of cellular processes
 - c. of cellular pros essays
 - d. of cellular progresses
- 10) He said his research could aid in _____
 - a. combat in bacterial diseases
 - b. combat thing bacterial diseases
 - c. combating bacterial diseases
 - d. combative bacterial diseases

LISTENING – Listen and fill in the gaps

From <https://breakingnewsenglish.com/2311/231127-bacteria-memories.html>

Just when scientists thought they knew all there was to know about bacteria, they have (1) _____ unexpected. They have found that bacteria have a mechanism within their (2) _____ that can store and pass on memories to future generations. The research was (3) _____ E. coli bacterium. This is one of Earth's most well-studied organisms. Researchers at the University of Texas wrote about how bacteria could form memories while (4) _____: "Bacteria don't have brains, but (5) _____ information from their environment, and if they have encountered that environment frequently, they can store it and quickly access it later (6) _____."

Bacterial memory differs from that in humans. It may be (7) _____ our muscle memory. Our bodily tissue has a sense of what to do next from having (8) _____ many times before. The researchers attributed bacterial memory to levels of iron in (9) _____. A researcher said: "Before there was oxygen in the Earth's atmosphere, early life was utilizing iron for a lot of cellular processes." He added: "Iron is not only (10) _____ origin of life on Earth, but also in the evolution of life. It makes sense that (11) _____ it." He said his research could aid in combating bacterial diseases, as "the more we know about bacterial behaviour, the easier it is (12) _____".

COMPREHENSION QUESTIONS

From <https://breakingnewsenglish.com/2311/231127-bacteria-memories.html>

1. What does the article say scientists have unearthed?
2. What does the article say is one of the most well-studied organisms?
3. What university is this research from?
4. What did researchers say bacteria lack?
5. From where do bacteria get information?
6. What might bacteria memory be similar to?
7. What does our body tissue have a sense of?
8. What did a researcher say was in the Earth's atmosphere before oxygen?
9. What was iron critical in the evolution of?
10. What could the research help to fight?

MULTIPLE CHOICE - QUIZ

From <https://breakingnewsenglish.com/2311/231127-bacteria-memories.html>

- 1) What does the article say scientists have unearthed?
 - a) new bacteria
 - b) worms
 - c) a cure to a disease
 - d) something unexpected
- 2) What does the article say is one of the most well-studied organisms?
 - a) norovirus
 - b) the E. coli bacteria
 - c) salmonella
 - d) listeria
- 3) What university is this research from?
 - a) the University of Bacteria
 - b) the University of Tuscany
 - c) the University of Turkey
 - d) the University of Texas
- 4) What did researchers say bacteria lack?
 - a) direction
 - b) electrons
 - c) a brain
 - d) a skeleton
- 5) From where do bacteria get information?
 - a) each other
 - b) our stomachs
 - c) fungus
 - d) their environment
- 6) What might bacteria memory be similar to?
 - a) computer memory
 - b) semantic memory
 - c) muscle memory
 - d) short-term memory
- 7) What does our body tissue have a sense of?
 - a) What to do next.
 - b) sniffles
 - c) power
 - d) fashion
- 8) What did a researcher say was in the Earth's atmosphere before oxygen?
 - a) pollen
 - b) lead
 - c) iron
 - d) water
- 9) What was iron critical in the evolution of?
 - a) making steel
 - b) life
 - c) plumbing
 - d) spinach
- 10) What could the research help to fight?
 - a) bacterial diseases
 - b) combat
 - c) life on Earth
 - d) evolution

ROLE PLAY

From <https://breakingnewsenglish.com/2311/231127-bacteria-memories.html>

Role A – Property

You think property is the most important thing to pass on to future generations. Tell the others three reasons why. Tell them why their things aren't as important. Also, tell the others which is the least important of these (and why): money, stories or cleaner cities.

Role B – Money

You think money is the most important thing to pass on to future generations. Tell the others three reasons why. Tell them why their things aren't as important. Also, tell the others which is the least important of these (and why): property, stories or cleaner cities.

Role C – Stories

You think stories are the most important things to pass on to future generations. Tell the others three reasons why. Tell them why their things aren't as important. Also, tell the others which is the least important of these (and why): money, property or cleaner cities.

Role D – Cleaner Cities

You think cleaner cities are the most important things to pass on to future generations. Tell the others three reasons why. Tell them why their things aren't as important. Also, tell the others which is the least important of these (and why): money, stories or property.

AFTER READING / LISTENING

From <https://breakingnewsenglish.com/2311/231127-bacteria-memories.html>

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

bacteria	memory
-----------------	---------------

- 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">• thought• single• ubiquitous• lacking• gather• quickly	<ul style="list-style-type: none">• differs• akin• levels• early• origin• combat
--	---

MEMORIES SURVEY

From <https://breakingnewsenglish.com/2311/231127-bacteria-memories.html>

Write five GOOD questions about memories 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.

MEMORIES 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 'bacteria'?
3. What do you know about bacteria?
4. What can we do to keep harmful bacteria away?
5. What do you think of bacteria having a form of memory?
6. What is the purpose of bacteria?
7. What memories do you think bacteria might pass on?
8. What are your earliest memories?
9. What memories do you want to pass on to future generations?
10. How good is your memory?

Bacteria pass 'memories' to future generations – 27th November 2023
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MEMORIES 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 'memory'?
13. What do you think about what you read?
14. What do you know about muscle memory?
15. How powerful is our memory?
16. What do you know about the origins of life on Earth?
17. What can we do to improve our memory?
18. What are your best memories?
19. What would you like to know about bacteria?
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/2311/231127-bacteria-memories.html>

Just when scientists thought they (1) _____ all there was to know about bacteria, they have unearthed something quite unexpected. They have found that bacteria have a mechanism within their single-(2) _____ forms that can store and pass on memories to future generations. The research was (3) _____ the ubiquitous E. coli bacterium. This is one of Earth's most well-studied organisms. Researchers at the University of Texas wrote about how bacteria could form memories while (4) _____ a brain: "Bacteria don't have (5) _____, but they can gather information from their environment, and if they have encountered that environment frequently, they can store it and quickly (6) _____ it later for their benefit."

Bacterial memory (7) _____ from that in humans. It may be more akin to our muscle memory. Our bodily tissue has a sense of what to do next from (8) _____ done it repetitively many times before. The researchers attributed bacterial memory to levels of iron in their physical (9) _____. A researcher said: "Before there was oxygen in the Earth's atmosphere, early life was utilizing iron for a lot of cellular processes." He added: "Iron is not only critical in the (10) _____ of life on Earth, but also in the (11) _____ of life. It makes sense that cells would utilize it." He said his research could aid (12) _____ combating bacterial diseases, as "the more we know about bacterial behaviour, the easier it is to combat them".

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

- | | | | | |
|-----|-------------------|-----------------|------------------|-----------------|
| 1. | (a) knew | (b) knowing | (c) knows | (d) known |
| 2. | (a) cells | (b) cellulite | (c) celled | (d) cellar |
| 3. | (a) at | (b) by | (c) on | (d) as |
| 4. | (a) fracking | (b) tracking | (c) slacking | (d) lacking |
| 5. | (a) brainy | (b) brainless | (c) brains | (d) brainwave |
| 6. | (a) excess | (b) access | (c) recess | (d) process |
| 7. | (a) differentials | (b) differs | (c) differences | (d) diffidence |
| 8. | (a) has | (b) having | (c) had | (d) have |
| 9. | (a) competition | (b) conditional | (c) constitution | (d) contraction |
| 10. | (a) organist | (b) organ | (c) original | (d) origin |
| 11. | (a) devolution | (b) revolution | (c) convolution | (d) evolution |
| 12. | (a) at | (b) on | (c) of | (d) in |

SPELLING

From <https://breakingnewsenglish.com/2311/231127-bacteria-memories.html>

Paragraph 1

1. unearted something quite unexpected
2. bacteria have a emihancsm
3. their single-dleelc forms
4. the uitouiqsbu E. coli bacterium
5. Earth's most well-studied rsoiamsgn
6. information from their nnmroeivetn

Paragraph 2

7. more ikan to our muscle memory
8. done it reeiltepyivt
9. tidrtbutae bacterial memory to levels of iron
10. in their physical stuniinoctot
11. a lot of llarelcu processes
12. in the loeoivutn of life

PUT THE TEXT BACK TOGETHER

From <https://breakingnewsenglish.com/2311/231127-bacteria-memories.html>

Number these lines in the correct order.

- () how bacteria could form memories while lacking a brain: "Bacteria don't have brains, but they can gather
- () oxygen in the Earth's atmosphere, early life was utilizing iron for a lot of cellular
- () Bacterial memory differs from that in humans. It may be more akin to our muscle memory. Our bodily
- () frequently, they can store it and quickly access it later for their benefit."
- () we know about bacterial behaviour, the easier it is to combat them".
- () bacterium. This is one of Earth's most well-studied organisms. Researchers at the University of Texas wrote about
- () something quite unexpected. They have found that bacteria have a mechanism within their single-celled forms
- () life. It makes sense that cells would utilize it." He said his research could aid in combating bacterial diseases, as "the more
- (**1**) Just when scientists thought they knew all there was to know about bacteria, they have unearthed
- () that can store and pass on memories to future generations. The research was on the ubiquitous E. coli
- () tissue has a sense of what to do next from having done it repetitively many times before. The researchers
- () information from their environment, and if they have encountered that environment
- () processes." He added: "Iron is not only critical in the origin of life on Earth, but also in the evolution of
- () attributed bacterial memory to levels of iron in their physical constitution. A researcher said: "Before there was

PUT THE WORDS IN THE RIGHT ORDER

From <https://breakingnewsenglish.com/2311/231127-bacteria-memories.html>

1. there was knew all know . They to
2. have single-celled a mechanism Bacteria their forms . within
3. E. coli on ubiquitous bacterium . the The was research
4. memories while lacking could Bacteria brain . a form
5. later benefit . access their quickly They for it
6. from differs Bacterial humans . that in memory
7. a what of sense do to next . Have
8. life . of in critical the is Iron origin
9. makes utilize cells sense It would that it .
10. bacterial diseases . could research in combating His aid

CIRCLE THE CORRECT WORD (20 PAIRS)

From <https://breakingnewsenglish.com/2311/231127-bacteria-memories.html>

Just when scientists thought they knew all there was to know about *bacterium / bacteria*, they have unearthed something quite unexpected. They have found that bacteria have a *machination / mechanism* within their single-celled forms that can store and pass *on / in* memories to future generations. The research was on the *ubiquity / ubiquitous* E. coli bacterium. This is one of Earth's most well-studied *organics / organisms*. Researchers at the University of Texas wrote about how bacteria could form memories while *slacking / lacking* a brain: "Bacteria don't have brains, but they can *lather / gather* information from their environment, and if they have *recounted / encountered* that environment frequently, they can store it and quickly *excess / access* it later for their *beneficial / benefit*."

Bacterial memory *difference / differs* from that in humans. It may be more *skin / akin* to our muscle memory. Our bodily *tissue / fissure* has a sense of what to do next from having done it repetitively many times *early / before*. The researchers attributed bacterial memory to levels of *ironing / iron* in their physical *constitution / constriction*. A researcher said: "Before there was oxygen in the Earth's atmosphere, early life was *idealizing / utilizing* iron for a lot of cellular processes." He added: "Iron is not only critical in the *origin / original* of life on Earth, but also in the evolution of life. It makes sense that cells would utilize it." He said his research could aid in *competing / combating* bacterial diseases, as "the more we know about bacterial behaviour, the easier it *be / is* to combat them".

Talk about the connection between each pair of words in italics, and why the correct word is correct. Look up the definition of new words.

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

From <https://breakingnewsenglish.com//url.html>

J_ st wh_ n sc_ nt_ sts th_ _ght th_ y kn_ w _ll th_ r_ w_ s
t_ kn_ w _b_ t b_ ct_ r_ , th_ y h_ v_ _n_ rth_ d
s_ m_ th_ ng q_ t_ _n_ xp_ ct_ d. Th_ y h_ v_ f_ nd th_ t
b_ ct_ r_ h_ v_ _ m_ ch_ n_ sm w_ th_ n th_ r_ s_ ngl_ -c_ ll_ d
f_ rms th_ t c_ n st_ r_ _nd p_ ss _n m_ m_ r_ s t_ f_ t_ r_
g_ n_ r_ t_ ns. Th_ r_ s_ rch_ w_ s _n th_ _b_ q_ t_ s _.
c_ l_ b_ ct_ r_ m. Th_ s _s _n_ _f _rth_ s m_ st w_ ll_
st_ d_ d _rg_ n_ sms. R_ s_ rch_ rs _t th_ _n_ v_ rs_ ty _f
T_ x_ s wr_ t_ _b_ t h_ w b_ ct_ r_ c_ ld f_ rm m_ m_ r_ s
wh_ l_ l_ ck_ ng _ br_ n: "B_ ct_ r_ d_ n' t h_ v_ br_ ns,
b_ t th_ y c_ n g_ th_ r _nf_ rm_ t_ n fr_ m th_ r_
nv r_ nm_ nt, _nd _f th_ y h_ v_ _nc_ nt_ r_ d th_ t
nv r_ nm_ nt fr_ q_ ntly, th_ y c_ n st_ r_ _t _nd q_ ckly
cc ss _t l_ t_ r_ f_ r th_ r_ b_ n_ f_ t."

B_ ct_ r_ l_ m_ m_ ry d_ ff_ rs fr_ m th_ t _n h_ m_ ns. _t m_ y
b_ m_ r_ _k_ n t_ _r m_ scl_ m_ m_ ry. _r b_ d_ ly
t_ ss_ h_ s _s_ ns_ _f wh_ t t_ d_ n_ xt fr_ m h_ v_ ng
d_ n_ _t r_ p_ t_ t_ v_ ly m_ ny t_ m_ s b_ f_ r_ . Th_
r_ s_ rch_ rs _ttr_ b_ t_ d b_ ct_ r_ l_ m_ m_ ry t_ l_ v_ ls _f
r n _n th_ r_ phys_ c_ l_ c_ nst_ t_ t_ n. _r s_ rch_ r
s_ d: "B_ f_ r_ th_ r_ w_ s _xyg_ n _n th_ _rth_ s
tm sph_ r_ , _rly l_ f_ w_ s _t_ l_ z_ ng _r_ n f_ r _l_ t_ _f
c_ ll_ l_ r pr_ c_ ss_ s." H_ _dd_ d: "_r_ n _s n_ t _nly
cr_ t_ c_ l_ _n th_ _r_ g_ n _f l_ f_ _n _rth_ , b_ t _ls_ _n
th_ _v_ l_ t_ _n _f l_ f_ . _t m_ k_ s s_ ns_ th_ t c_ ll_ s w_ ld
t l_ z_ _t." H_ s_ d h_ s r_ s_ rch_ c_ ld _d _n
c_ mb_ t_ ng b_ ct_ r_ l_ d_ s_ s_ s, _s "th_ m_ r_ w_ kn_ w
b t b_ ct_ r_ l_ b_ h_ v_ _r, th_ _s_ r_ _t _s t_ c_ mb_ t
th_ m_ ."

PUNCTUATE THE TEXT AND ADD CAPITALS

From <https://breakingnewsenglish.com/2311/231127-bacteria-memories.html>

just when scientists thought they knew all there was to know about bacteria they have unearthed something quite unexpected they have found that bacteria have a mechanism within their singlecelled forms that can store and pass on memories to future generations the research was on the ubiquitous e coli bacterium this is one of earths most wellstudied organisms researchers at the university of texas wrote about how bacteria could form memories while lacking a brain bacteria dont have brains but they can gather information from their environment and if they have encountered that environment frequently they can store it and quickly access it later for their benefit

bacterial memory differs from that in humans it may be more akin to our muscle memory our bodily tissue has a sense of what to do next from having done it repetitively many times before the researchers attributed bacterial memory to levels of iron in their physical constitution a researcher said before there was oxygen in the earths atmosphere early life was utilizing iron for a lot of cellular processes he added iron is not only critical in the origin of life on earth but also in the evolution of life it makes sense that cells would utilize it he said his research could aid in combating bacterial diseases as the more we know about bacterial behaviour the easier it is to combat them

PUT A SLASH (/) WHERE THE SPACES ARE

From <https://breakingnewsenglish.com//url.html>

Just when scientists thought they knew all there was to know about bacteria, they have unearthed something quite unexpected. They have found that bacteria have a mechanism within their single-celled form that can store and pass on memories to future generations. The research was on the ubiquitous *E. coli* bacterium. This is one of Earth's most well-studied organisms. Researchers at the University of Texas wrote about how bacteria could form memories while lacking a brain: "Bacteria don't have brains, but they can gather information from their environment, and if they have encountered that environment frequently, they can store it and quickly access it later for their benefit." Bacterial memory differs from that in humans. It may be more akin to our muscle memory. Our bodily tissue has a sense of what to do next from having done it repetitively many times before. The researchers attributed bacterial memory to levels of iron in their physical constitution. A researcher said: "Before there was oxygen in the Earth's atmosphere, early life was utilizing iron for a lot of cellular processes." He added: "Iron is not only critical in the origin of life on Earth, but also in the evolution of life. It makes sense that cells would utilize it." He said his research could aid in combating bacterial diseases, as "the more we know about bacterial behaviour, the easier it is to combat them".

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. MEMORIES: Make a poster about memories. Show your work to your classmates in the next lesson. Did you all have similar things?

4. BACTERIA: Write a magazine article about spending more money to kill all harmful bacteria. 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 memory. Ask him/her three questions about it. Give him/her three of your ideas on how to improve our memory. 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. d 3. a 4. e 5. f 6. b 7. g
8. i 9. l 10. n 11. j 12. h 13. k 14. m

TRUE / FALSE (p.5)

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

SYNONYM MATCH (p.5)

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

COMPREHENSION QUESTIONS (p.9)

1. Something unexpected
2. The E. coli bacteria
3. The University of Texas
4. A brain
5. Their environment
6. Muscle memory
7. What to do next
8. Iron
9. Life
10. Bacterial diseases

WORDS IN THE RIGHT ORDER (p.19)

1. They knew all there was to know.
2. Bacteria have a mechanism within their single-celled forms.
3. The research was on the ubiquitous E. coli bacterium.
4. Bacteria could form memories while lacking a brain.
5. They quickly access it later for their benefit.
6. Bacterial memory differs from that in humans.
7. Have a sense of what to do next.
8. Iron is critical in the origin of life.
9. It makes sense that cells would utilize it.
10. His research could aid in combating bacterial diseases.

MULTIPLE CHOICE - QUIZ (p.10)

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

ALL OTHER EXERCISES

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