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Level 6

Astronauts' brains change shape during spaceflight

5th February, 2017

<http://www.breakingnewsenglish.com/1702/170205-brains.html>

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

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THE ARTICLE

From <http://www.BreakingNewsEnglish.com/1702/170205-brains.html>

Researchers from the University of Michigan in the USA have found that the brain of astronauts changes shape during spaceflight. It is the first study to look into how the brain changes on the journey into space. Researchers looked at pictures of the brains of 26 astronauts who spent time in space. The photos were taken by high-tech medical machines called MRIs. Twelve of the astronauts spent two weeks as Space Shuttle crew members, and 14 spent six months on the International Space Station. All of them experienced increases and decreases in the size of different parts of the brain. The researchers said that the longer an astronaut spent in space, the bigger the differences in size were.

The research produced some interesting findings. The researchers explained that, "gravity is not available to pull fluids down in the body". This means there is a shift in the position of the brain inside the skull. The brain becomes either more squashed or bigger in size. The findings could help doctors in the future to treat problems that affect the brain's function. One possibility is to treat people who develop problems caused by long-term bed rest. Another possibility is to treat those who have a build-up of fluid in the brain, which can lead to brain damage. The researchers also say we will understand more about how neurons in the brain make connections. In addition, the findings will help future space travelers on their journey to Mars.

Sources: <http://www.futurity.org/astronauts-brains-space-1348942/>
<http://www.nature.com/articles/s41526-016-0001-9>
<https://www.inverse.com/article/27330-astronaut-brain-change-shape-space>

WARM-UPS

1. BRAINS: Students walk around the class and talk to other students about brains. 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?

brain / astronauts / journey / space / medical / increases / differences / size / interesting / findings / gravity / shift / position / function / possibility / fluid / journey

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

3. MARS: Students A **strongly** believe it is better to live on Mars than the Moon; Students B **strongly** believe the opposite. Change partners again and talk about your conversations.

4. SHAPES: What are the best shapes for these body parts? What alternative shapes would be interesting and why? Complete this table with your partner(s). Change partners often and share what you wrote.

	The best shape	Alternative shapes
Eyes		
Lips		
Nose		
Stomach		
Eyebrows		
Heart		

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

6. BRAIN FUNCTIONS: Rank these with your partner. Put the best at the top. Change partners often and share your rankings.

- Memory
- Creativity
- Language
- Social interaction
- Emotional response
- Planning
- Learning
- Maths

BEFORE READING / LISTENING

From <http://www.BreakingNewsEnglish.com/1702/170205-brains.html>

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

- a. The research is from a university in France. **T / F**
- b. This is the second study into how spaceflight changes the brain. **T / F**
- c. Researchers look at photos of the brains of 26 astronauts. **T / F**
- d. A longer time in space meant smaller size differences in the brain. **T / F**
- e. A lack of gravity was one reason for the changes in brain shape and size. **T / F**
- f. This study could help people who have to stay in bed for a long time. **T / F**
- g. This research will not increase understanding about neuron behavior. **T / F**
- h. The findings will help humans on their journey to Mars. **T / F**

2. SYNONYM MATCH:

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

- | | |
|-----------------------|----------------|
| 1. found | a. heal |
| 2. look into | b. dimensions |
| 3. journey | c. underwent |
| 4. experienced | d. liquid |
| 5. size | e. examine |
| 6. findings | f. comprehend |
| 7. shift | g. discovered |
| 8. treat | h. adjustment |
| 9. fluid | i. trip |
| 10. understand | j. conclusions |

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

- | | |
|---------------------------------------|--------------------------|
| 1. the first study to look into how | a. of the brain |
| 2. astronauts who spent | b. size were |
| 3. The photos were taken by high- | c. interesting findings |
| 4. decreases in the size of different | d. the brain changes |
| 5. the bigger the differences in | e. make connections |
| 6. The research produced some | f. tech medical machines |
| 7. there is a shift in the position | g. of fluid in the brain |
| 8. treat problems that affect | h. parts of the brain |
| 9. those who have a build-up | i. time in space |
| 10. how neurons in the brain | j. the brain's function |

GAP FILL

From <http://www.BreakingNewsEnglish.com/1702/170205-brains.html>

Researchers from the University of Michigan in the USA have (1) _____ that the brain of astronauts changes shape during spaceflight. It is the first (2) _____ to look into how the brain changes on the journey into space. Researchers looked at pictures of the brains of 26 astronauts who (3) _____ time in space. The photos were taken by high-(4) _____ medical machines called MRIs. Twelve of the astronauts spent two weeks as Space Shuttle (5) _____ members, and 14 spent six months on the International Space Station. All of them experienced increases and (6) _____ in the size of different parts of the brain. The researchers said that the (7) _____ an astronaut spent in space, the bigger the differences in (8) _____ were.

study
decreases
found
size
tech
longer
spent
crew

The research produced some interesting (9) _____. The researchers explained that, "(10) _____ is not available to pull fluids down in the body". This means there is a (11) _____ in the position of the brain inside the skull. The brain becomes either more (12) _____ or bigger in size. The findings could help doctors in the future to treat problems that affect the brain's function. One possibility is to treat people who (13) _____ problems caused by long-term bed rest. Another possibility is to treat those who have a build-up of (14) _____ in the brain, which can lead to brain damage. The researchers also say we will understand more about how (15) _____ in the brain make connections. In addition, the findings will help future space travelers on their (16) _____ to Mars.

squashed
findings
journey
fluid
shift
neurons
gravity
develop

LISTENING – Guess the answers. Listen to check.

From <http://www.BreakingNewsEnglish.com/1702/170205-brains.html>

- 1) It is the first study to look into how the brain changes _____
 - a. on the journey
 - b. on the journal
 - c. on the jersey
 - d. on the gurney
- 2) Researchers looked at pictures of the brains of 26 astronauts who _____ space
 - a. spent timing in
 - b. spent timing
 - c. spent time in
 - d. spent timed in
- 3) Twelve of the astronauts spent two weeks as Space Shuttle _____
 - a. clue members
 - b. chew members
 - c. crew members
 - d. cruise members
- 4) experienced increases and decreases in the size of different _____
 - a. parties of the brain
 - b. partners of the brain
 - c. apart of the brain
 - d. parts of the brain
- 5) the longer an astronaut spent in space, the bigger the differences _____
 - a. ion size were
 - b. on size were
 - c. inn size were
 - d. in size were
- 6) The researchers explained that gravity is not available to pull _____ the body
 - a. fluids low in
 - b. fluids down in
 - c. fluids decrease in
 - d. fluids fall in
- 7) This means there is a shift in the position of the brain _____
 - a. inside the squawk
 - b. inside the squall
 - c. inside the skill
 - d. inside the skull
- 8) The findings could help doctors in the future to treat problems that affect the _____
 - a. brain's function
 - b. brains' function
 - c. brains function
 - d. brainless function
- 9) Another possibility is to treat those who have a build-up _____ brain
 - a. of fruit in the
 - b. of food in the
 - c. of frond in the
 - d. of fluid in the
- 10) understand more about how neurons in the brain _____
 - a. do connections
 - b. give connections
 - c. make connections
 - d. be connections

LISTENING – Listen and fill in the gaps

From <http://www.BreakingNewsEnglish.com/1702/170205-brains.html>

Researchers from the University of Michigan in the USA (1) _____ the brain of astronauts changes shape during spaceflight. It is the first study (2) _____ how the brain changes on the journey into space. Researchers looked at pictures of the brains of 26 astronauts who (3) _____ space. The photos were taken by high-tech medical machines called MRIs. Twelve of the astronauts spent (4) _____ Space Shuttle crew members, and 14 spent six months on the International Space Station. All of them experienced increases (5) _____ the size of different parts of the brain. The researchers said that the longer an astronaut spent in space, the bigger the differences (6) _____.

The research produced some (7) _____. The researchers explained that, "gravity is not available (8) _____ down in the body". This means there is a shift in the position of the brain inside the skull. The brain (9) _____ more squashed or bigger in size. The findings could help doctors in the future to treat problems that affect the brain's function. One possibility (10) _____ people who develop problems caused by long-term bed rest. Another possibility is to treat those who have (11) _____ fluid in the brain, which can lead to brain damage. The researchers also say we will understand more about how (12) _____ brain make connections. In addition, the findings will help future space travelers on their journey to Mars.

COMPREHENSION QUESTIONS

From <http://www.BreakingNewsEnglish.com/1702/170205-brains.html>

1. At which university was the research conducted?
2. How many studies before this one looked at this subject?
3. How many astronauts in the study had spent time on the Space Shuttle?
4. How long had astronauts spent on the International Space Station?
5. What was bigger in the brain the longer astronauts spent in space?
6. What did the article say the research produced?
7. What bed-related problem was mentioned in the article?
8. What could there be a build-up of in the brain?
9. What will we understand more about what neurons do?
10. What will the study help space travelers reach in the future?

MULTIPLE CHOICE - QUIZ

From <http://www.BreakingNewsEnglish.com/1702/170205-brains.html>

- 1) At which university was the research conducted?
 - a) Tokyo
 - b) Sorbonne
 - c) Michigan
 - d) Melbourne
- 2) How many studies before this one looked at this subject?
 - a) 0
 - b) 1
 - c) 2
 - d) 3
- 3) How many astronauts in the study had spent time on the Space Shuttle?
 - a) 26
 - b) 16
 - c) 14
 - d) 12
- 4) How long had astronauts spent on the International Space Station?
 - a) 2 months
 - b) 6 months
 - c) 4 months
 - d) 8 months
- 5) What was bigger in the brain the longer astronauts spent in space?
 - a) pressure
 - b) neurons
 - c) size differences
 - d) intelligence
- 6) What did the article say the research produced?
 - a) a controversy
 - b) interesting findings
 - c) a lot of money
 - d) many questions
- 7) What bed-related problem was mentioned in the article?
 - a) insomnia
 - b) bed sores
 - c) nightmares
 - d) long-term bed rest
- 8) What could there be a build-up of in the brain?
 - a) information
 - b) fluid
 - c) stress
 - d) protein
- 9) What will we understand more about what neurons do?
 - a) how they make connections
 - b) how they are created
 - c) what they make
 - d) their size
- 10) What will the study help space travelers reach in the future?
 - a) targets
 - b) the stars
 - c) dreams
 - d) Mars

ROLE PLAY

From <http://www.BreakingNewsEnglish.com/1702/170205-brains.html>

Role A – Memory

You think memory is the most important brain function. Tell the others three reasons why. Tell them why their functions are not as important. Also, tell the others which is the least important of these (and why): creativity, social interaction or planning.

Role B – Creativity

You think creativity is the most important brain function. Tell the others three reasons why. Tell them why their functions are not as important. Also, tell the others which is the least important of these (and why): memory, social interaction or planning.

Role C – Social Interaction

You think social interaction is the most important brain function. Tell the others three reasons why. Tell them why their functions are not as important. Also, tell the others which is the least important of these (and why): creativity, memory or planning.

Role D – Planning

You think planning is the most important brain function. Tell the others three reasons why. Tell them why their functions are not as important. Also, tell the others which is the least important of these (and why): creativity, social interaction or memory.

AFTER READING / LISTENING

From <http://www.BreakingNewsEnglish.com/1702/170205-brains.html>

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

change	shape
---------------	--------------

- 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">• found• 26• 12• 14• all• longer	<ul style="list-style-type: none">• interesting• shift• doctors• bed• lead• Mars
---	---

BRAINS SURVEY

From <http://www.BreakingNewsEnglish.com/1702/170205-brains.html>

Write five GOOD questions about brains 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.

BRAINS 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 'brain'?
3. What do you think about what you read?
4. What do you think the speed of a space rocket would feel like?
5. In what ways would you be a good astronaut?
6. How important is space travel?
7. What would you do if you went into space?
8. What do you think life is like on the International Space Station?
9. What do you know about the brain?
10. What would you do with more brain power?

Astronauts' brains change shape during spaceflight – 5th February, 2017
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BRAINS 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 'astronaut'?
13. What do you know about gravity?
14. How can you keep your brain healthy?
15. In what ways would you be a bad astronaut?
16. How dangerous is space travel?
17. What can go wrong with our brain?
18. What do you know about neurons?
19. What would it be like to go to Mars?
20. What questions would you like to ask an astronaut?

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/1702/170205-brains.html>

Researchers from the University of Michigan in the USA have (1) _____ that the brain of astronauts changes shape during spaceflight. It is the first study to look into how the brain changes (2) _____ the journey into space. Researchers looked at pictures of the brains of 26 astronauts who spent time in space. The photos were taken by high-tech (3) _____ machines called MRIs. Twelve of the astronauts spent two weeks (4) _____ Space Shuttle crew members, and 14 spent six months on the International Space Station. All of them experienced increases and decreases (5) _____ the size of different parts of the brain. The researchers said that the longer an astronaut spent in space, the bigger the differences in size (6) _____.

The research produced some interesting findings. The researchers explained that, "(7) _____ is not available to pull fluids down in the body". This means there is a (8) _____ in the position of the brain inside the skull. The brain becomes either more squashed or bigger in size. The findings could help doctors in the future to treat problems that (9) _____ the brain's function. One possibility is to treat people who develop problems caused by (10) _____-term bed rest. Another possibility is to treat those who have a build-up of (11) _____ in the brain, which can lead to brain damage. The researchers also say we will understand more about how (12) _____ in the brain make connections. In addition, the findings will help future space travelers on their journey to Mars.

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

- | | | | | |
|-----|---------------|--------------|---------------|---------------|
| 1. | (a) funded | (b) found | (c) founded | (d) finding |
| 2. | (a) in | (b) on | (c) at | (d) to |
| 3. | (a) medically | (b) medicine | (c) medicinal | (d) medical |
| 4. | (a) has | (b) as | (c) is | (d) was |
| 5. | (a) on | (b) in | (c) as | (d) so |
| 6. | (a) was | (b) is | (c) were | (d) be |
| 7. | (a) brevity | (b) clarity | (c) gravity | (d) parity |
| 8. | (a) shaft | (b) sift | (c) shift | (d) swift |
| 9. | (a) infect | (b) effect | (c) reflect | (d) affect |
| 10. | (a) lengths | (b) lengthen | (c) lengthy | (d) long |
| 11. | (a) fluid | (b) squid | (c) cupid | (d) quid |
| 12. | (a) lines | (b) links | (c) neurons | (d) elections |

SPELLING

From <http://www.BreakingNewsEnglish.com/1702/170205-brains.html>

Paragraph 1

1. the enrjouy into space.
2. high-tech ecmadli machines
3. Space lhSeutt
4. All of them ixcedeprne increases
5. seaecresd in the size
6. The essererhrca

Paragraph 2

7. interesting nisingdf
8. tviragy is not available
9. pull siudfl down in the body
10. becomes either more aesuhdqs or bigger
11. Another iiltsypoibs
12. rounnse in the brain

PUT THE TEXT BACK TOGETHER

From <http://www.BreakingNewsEnglish.com/1702/170205-brains.html>

Number these lines in the correct order.

- () members, and 14 spent six months on the International Space Station. All of them experienced increases
- () doctors in the future to treat problems that affect the brain's function. One possibility is to treat
- () skull. The brain becomes either more squashed or bigger in size. The findings could help
- () shape during spaceflight. It is the first study to look into how the brain changes on the journey
- () into space. Researchers looked at pictures of the brains of 26 astronauts who spent time in space. The photos were
- () to pull fluids down in the body". This means there is a shift in the position of the brain inside the
- () how neurons in the brain make connections. In addition, the findings will help future space travelers on their journey to Mars.
- () taken by high-tech medical machines called MRIs. Twelve of the astronauts spent two weeks as Space Shuttle crew
- () people who develop problems caused by long-term bed rest. Another possibility is to treat those who have a build-up
- () an astronaut spent in space, the bigger the differences in size were.
- (**1**) Researchers from the University of Michigan in the USA have found that the brain of astronauts changes
- () The research produced some interesting findings. The researchers explained that, "gravity is not available
- () of fluid in the brain, which can lead to brain damage. The researchers also say we will understand more about
- () and decreases in the size of different parts of the brain. The researchers said that the longer

PUT THE WORDS IN THE RIGHT ORDER

From <http://www.BreakingNewsEnglish.com/1702/170205-brains.html>

1. the how into look to study first the is It changes brain .
2. time spent who astronauts 26 of brains the of Pictures space in .
3. by tech The taken - machines were high medical photos .
4. as Astronauts Space spent Shuttle two crew weeks members .
5. of of Decreases size parts brain the different the in .
6. pull fluids down in the body Gravity is not available to .
7. skull brain position shift There inside of in is the the the a .
8. the function problems affect brain's Treat that .
9. those the of build who brain fluid - have Treat in up a .
10. connections in More the about brain how make neurons .

CIRCLE THE CORRECT WORD (20 PAIRS)

From <http://www.BreakingNewsEnglish.com/1702/170205-brains.html>

Researchers from the University of Michigan in the USA have *finding / found* that the brain of astronauts changes shape during spaceflight. It is the first study to look *into / in* how the brain changes *on / in* the journey into space. Researchers *looked / looking* at pictures of the brains *for / of* 26 astronauts who spent time in space. The photos were *taken / taking* by high-tech medical machines called MRIs. Twelve of the astronauts spent two weeks *was / as* Space Shuttle crew members, and 14 spent six months on the International Space Station. All of *them / they* experienced increases and decreases in the size of *different / difference* parts of the brain. The researchers said that the longer an astronaut spent in space, the bigger the differences in size *were / was*.

The research produced some interesting *funding / findings*. The researchers explained that, "*gravity / brevity* is not available to pull *fluids / fluidity* down in the body". This means there is a *shaft / shift* in the position of the brain inside the skull. The brain becomes either more squashed or bigger in size. The findings could help doctors *in / on* the future to treat problems that affect the brain's function. One possibility is to treat people who develop problems caused by long-term bed rest. Another possibility is to *treatment / treat* those who have a *built-up / build-up* of fluid in the brain, which can lead to *brain / brainy* damage. The researchers also say we will understand more about how *neurons / nervous* in the brain make connections. In addition, the findings will help future *spatial / space* travelers on their journey to Mars.

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/1702/170205-brains.html>

R_s__rch_rs fr_m th_ _n_v_rs_ty _f M_ch_g_n _n th_ _S_ h_v_ f__nd th_t th_ br__n _f _str_n__ts ch_ng_s sh_p_ d_r_ng sp_c_fl_ght. _t_s th_ f_rst st_dy t_l__k _nt_ h_w th_ br__n ch_ng_s _n th_ j__rn_y _nt_ sp_c_. R_s__rch_rs l__k_d _t_p_ct_r_s _f th_ br__ns _f 26 _str_n__ts wh_ sp_nt t_m_ _n sp_c_. Th_ ph_t_s w_r_ t_k_n by h_gh-t_ch m_d_c_l m_ch_n_s c_ll_d MR_s. Tw_lv_ _f th_ _str_n__ts sp_nt tw_ w__ks _s Sp_c_ Sh_ttl_ cr_w m_mb_rs, _nd 14 sp_nt s_x m_nths _n th_ _nt_rn_t__n_l Sp_c_ St_t__n. _ll _f th_m _xp_r__nc_d _ncr__s_s _nd d_cr__s_s _n th_ s_z_ _f d_ff_r_nt p_rts _f th_ br__n. Th_ r_s__rch_rs s__d th_t th_ l_ng_r_n _str_n__t sp_nt _n sp_c_, th_ b_gg_r th_ d_ff_r_nc_s _n s_z_ w_r_.

Th_ r_s__rch pr_d_c_d s_m_ _nt_r_st_ng f_nd_ngs. Th_ r_s__rch_rs _xpl__n_d th_t, "gr_v_ty _s n_t _v__l_b_l t_p_ll fl__ds d_wn _n th_ b_dy". Th_s m__ns th_r__s _sh_ft _n th_ p_s_t__n _f th_ br__n ns_d th_ sk_ll. Th_ br__n b_c_m_s __th_r m_r_sq__sh_d _r b_gg_r _n s_z_. Th_ f_nd_ngs c__ld h_lp d_ct_rs _n th_ f_t_r_t tr__t pr_b_l_ms th_t _ff_ct th_ br__n's f_nct__n. _n_p_ss_b_l_ty _s t_tr__t p__pl_ wh_ d_v_l_p pr_b_l_ms c__s_d by l_ng-t_rm b_d_r_st. _n_th_r p_ss_b_l_ty _s t_tr__t th_s_ wh_ h_v_ _b__ld-p _f fl__d _n th_ br__n, wh_ch c_n l__d t_ br__n d_m_g_. Th_ r_s__rch_rs _ls_ s_y w_ w_ll _nd_rst_nd m_r_ _b__t h_w n__r_ns _n th_ br__n m_k_ c_nn_ct__ns. _n _dd_t__n, th_ f_nd_ngs w_ll h_lp f_t_r_ sp_c_ tr_v_ll_rs n th_r j__rn_y t_ M_rs.

PUNCTUATE THE TEXT AND ADD CAPITALS

From <http://www.BreakingNewsEnglish.com/1702/170205-brains.html>

researchers from the university of michigan in the usa have found that the brain of astronauts changes shape during spaceflight it is the first study to look into how the brain changes on the journey into space researchers looked at pictures of the brains of 26 astronauts who spent time in space the photos were taken by high-tech medical machines called mris twelve of the astronauts spent two weeks as space shuttle crew members and 14 spent six months on the international space station all of them experienced increases and decreases in the size of different parts of the brain the researchers said that the longer an astronaut spent in space the bigger the differences in size were

the research produced some interesting findings the researchers explained that "gravity is not available to pull fluids down in the body" this means there is a shift in the position of the brain inside the skull the brain becomes either more squashed or bigger in size the findings could help doctors in the future to treat problems that affect the brain's function one possibility is to treat people who develop problems caused by long-term bed rest another possibility is to treat those who have a build-up of fluid in the brain which can lead to brain damage the researchers also say we will understand more about how neurons in the brain make connections in addition the findings will help future space travellers on their journey to mars

PUT A SLASH (/) WHERE THE SPACES ARE

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Researchers from the University of Michigan in the USA have found that the brain of astronauts changes shape during spaceflight. It is the first study to look into how the brain changes on the journey into space. Researchers looked at pictures of the brains of 26 astronauts who spent time in space. The photos were taken by high-tech medical machines called MRIs. Twelve of the astronauts spent two weeks as Space Shuttle crew members, and 14 spent six months on the International Space Station. All of them experienced increases and decreases in the size of different parts of the brain. The researchers said that the longer an astronaut spent in space, the bigger the differences in size were. The research produced some interesting findings. The researcher explained that, "gravity is not available to pull fluids down in the body". This means there is a shift in the position of the brain inside the skull. The brain becomes either more squashed or bigger in size. The findings could help doctors in the future to treat problems that affect the brain's function. One possibility is to treat people who develop problems caused by long-term bed rest. Another possibility is to treat those who have a build-up of fluid in the brain, which can lead to brain damage. The researchers also say we will understand more about how neurons in the brain make connections. In addition, the findings will help future space travellers on their journey to Mars.

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 story. Share what you discover with your partner(s) in the next lesson.

3. BRAINS: Make a poster about our brain. Show your work to your classmates in the next lesson. Did you all have similar things?

4. SUPER-IMPROVED: Write a magazine article about scientists allowing us to have super-improved brains in the future. 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 brains. Ask him/her three questions about them. Give him/her three of your ideas on how we can make our brains healthy. 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 T d F e T f T g F h T

SYNONYM MATCH (p.4)

- | | |
|----------------|----------------|
| 1. found | a. discovered |
| 2. look into | b. examine |
| 3. journey | c. trip |
| 4. experienced | d. underwent |
| 5. size | e. dimensions |
| 6. findings | f. conclusions |
| 7. shift | g. adjustment |
| 8. treat | h. heal |
| 9. fluid | i. liquid |
| 10. understand | j. comprehend |

COMPREHENSION QUESTIONS (p.8)

1. Michigan
2. None
3. 12
4. Six months
5. Differences in size
6. Interesting findings
7. Long-term bed rest
8. Fluid
9. How they make connections
10. Mars

MULTIPLE CHOICE - QUIZ (p.9)

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