

"1,000 IDEAS & ACTIVITIES FOR LANGUAGE TEACHERS"

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Artificial brain ten years away

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THE ARTICLE

A top British professor has told a cutting-edge ideas conference he is close to building a replica human brain. Professor Henry Markham told the annual Technology, Entertainment, Design global conference that a working synthetic brain can be built in the next decade. He told his audience: "It is not impossible to build a human brain and we can do it in 10 years." He set himself a challenge by stating that if he succeeded, he would "send a hologram to T.E.D. to talk." Professor Markham is director of the Blue Brain project, which aims to engineer mammals' brains from laboratory data. He has already had success with creating parts of a rat's brain. Markham said the human brain was so complex, it was an "almost frightening organ".

Professor Markham hoped his research would lead to new treatments for mental illnesses. He said: "There are two billion people on the planet affected by mental disorder." Markham believes synthetic brain technology will reduce the need for experiments on animals. "We cannot keep on doing animal experiments forever," he said. This will please many animal rights activists, who say such research is cruel. He hopes to create a kind of "Noah's Ark" of animal brain models. Professor Markham provided a simple explanation of his work: "It's a bit like going and cataloguing a bit of the rainforest....But it is a bit more than cataloguing because you have to describe and discover all the rules of communication, the rules of connectivity."

WARM-UPS

1. THE BRAIN: Walk around the class and talk to other students about the brain. Change partners often. Sit with your first partner(s) and share your findings.

2. CHAT: In pairs / groups, decide which of these topics or words from the article are most interesting and which are most boring.

top professors / cutting-edge ideas / replicas / design / challenges / data / organs / new treatments / mental illnesses / experiments / animal rights / rainforests / rules

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

3. ARTIFICIAL: Are these artificial things useful? Complete this table with your partner(s). Change partners and share your ideas. Change again and share what you heard.

	Useful?	Better than the real thing?
Brain		
Intelligence		
Flowers		
Leather		
Limbs		
Grass		

4. REPLICA: Students A **strongly** believe creating an artificial brain is a good thing; Students B **strongly** believe the opposite. Change partners again and talk about your conversations.

5. ORGANS: What do our body organs do? Think of as many ideas as you can for each organ. Write the number of ideas next to each word. Change partners and compare your ideas. Are there any extra functions these organs need to do?

_____ the brain
 _____ the skin
 _____ the heart
 _____ the lungs

_____ the liver
 _____ the stomach
 _____ the liver
 _____ the kidneys

6. BRAIN: Spend one minute writing down all of the different words you associate with the word 'brain'. Share your words with your partner(s) and talk about them. Together, put the words into different categories.

BEFORE READING / LISTENING

1. TRUE / FALSE: Look at the article's headline and guess whether these sentences are true (T) or false (F):

- a. An academic will build a human brain within the next decade. T / F
- b. The professor told people it isn't impossible to make a brain. T / F
- c. He said he would send everyone a telegram when he finished the brain. T / F
- d. The professor has already made a complete rat's brain. T / F
- e. The new research could be good news for mental illness sufferers. T / F
- f. The new research could be good news for test laboratory animals. T / F
- g. The professor hopes to create a database on rainforests next. T / F
- h. Cataloguing trees in the rainforest is easier than cataloguing the brain. T / F

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

- | | |
|-----------------|----------------|
| 1. cutting edge | a. complicated |
| 2. replica | b. campaigners |
| 3. synthetic | c. listing |
| 4. complex | d. copy |
| 5. frightening | e. scary |
| 6. treatments | f. cut |
| 7. reduce | g. the latest |
| 8. activists | h. cures |
| 9. a bit | i. man-made |
| 10. cataloguing | j. a little |

3. PHRASE MATCH: Match the following phrases from the article (sometimes more than one combination is possible):

- | | |
|---------------------------|---------------------------|
| 1. a cutting-edge | a. a challenge |
| 2. close to building a | b. so complex |
| 3. He set himself | c. experiments on animals |
| 4. He has already | d. ideas conference |
| 5. the human brain was | e. than cataloguing |
| 6. lead to new treatments | f. had success |
| 7. reduce the need for | g. rules of communication |
| 8. a simple explanation | h. replica human brain |
| 9. it is a bit more | i. of his work |
| 10. discover all the | j. for mental illnesses |

WHILE READING / LISTENING

GAP FILL: Put the words into the gaps in the text.

A top British professor has told a _____-edge ideas conference he is close to building a replica human brain. Professor Henry Markham told the _____ Technology, Entertainment, Design global conference that a working synthetic brain can be built in the next _____. He told his audience: "It is not impossible to build a human brain and we can do it in 10 years." He _____ himself a challenge by stating that if he succeeded, he would "send a hologram to T.E.D. to _____." Professor Markham is director of the Blue Brain project, which _____ to engineer mammals' brains from laboratory data. He has already had _____ with creating parts of a rat's brain. Markham said the human brain was so complex, it was an "almost frightening _____".

talk
set
success
annual
organ
cutting
decade
aims

Professor Markham hoped his research would _____ to new treatments for mental illnesses. He said: "There are two billion people on the planet _____ by mental disorder." Markham believes synthetic brain technology will reduce the _____ for experiments on animals. "We cannot keep on doing animal experiments _____," he said. This will please many animal _____ activists, who say such research is cruel. He hopes to create a kind of "Noah's Ark" of animal brain models. Professor Markham provided a _____ explanation of his work: "It's a bit like going and cataloguing a _____ of the rainforest....But it is a bit more than cataloguing because you have to describe and discover all the rules of communication, the _____ of connectivity."

bit
rights
lead
rules
affected
forever
simple
need

LISTENING: Listen and fill in the gaps.

A top British professor _____-edge ideas conference he is _____ a replica human brain. Professor Henry Markham told the annual Technology, Entertainment, Design global conference that a working synthetic brain _____ next decade. He told his audience: "It is not impossible to build a human brain and we can do it in 10 years." He set himself a challenge _____ he succeeded, he would "send a hologram to T.E.D. to talk." Professor Markham is director of the Blue Brain project, which _____ mammals brains from laboratory data. He has already had success with creating parts of a rat's brain. Markham said the human brain _____ was an "almost frightening organ".

Professor Markham hoped his research _____ treatments for mental illnesses. He said: "There are two billion people on the planet _____ disorder." Markham believes synthetic brain technology will reduce the need for experiments on animals. "We cannot _____ animal experiments forever," he said. This will please many animal rights activists, who _____ is cruel. He hopes to create a kind of "Noah's Ark" of animal brain models. Professor Markham provided a simple explanation of his work: "_____ going and cataloguing a bit of the rainforest....But it is a bit more than cataloguing because you have to describe and discover _____ communication, the rules of connectivity."

AFTER READING / LISTENING

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

artificial	brain
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- 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">• ideas• working• impossible• challenge• aims• frightening	<ul style="list-style-type: none">• lead• affected• need• cruel• rainforest• rules
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STUDENT BRAIN SURVEY

Write five GOOD questions about the brain 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.

BRAIN DISCUSSION

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

- a) What did you think when you read the headline?
- b) What springs to mind when you hear the word 'brain'?
- c) Are you concerned about research into artificial body parts?
- d) What could scientists do with an artificial brain?
- e) Do you think brain transplants are a good idea?
- f) How do you think personality and intelligence can be created in an artificial brain?
- g) Would you like to see scientists create an artificial person?
- h) Do you think the artificial brain will perform as well as a real brain?
- i) How would you rate the performance of your brain?
- j) What did the professor mean when he called the brain "an almost frightening organ"?

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BRAIN DISCUSSION

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

- a) Did you like reading this article?
- b) What do you know about the brain?
- c) Would you have treatment to make you more brainy?
- d) Do you think the professor's research will lead to cures and treatments for those suffering from mental disorders?
- e) Do you think research on animals is cruel and needs to be stopped?
- f) What do you think of the idea of a "Noah's Ark" of animal brains?
- g) Do you think professor Markham is creating a kind of monster?
- h) Would you rather research the rainforest of the brain?
- i) How can you discover all the rules of communication and connectivity?
- j) What questions would you like to ask professor Henry Markham?

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LANGUAGE

A top British professor has told a (1) ____-edge ideas conference he is close to building a replica human brain. Professor Henry Markham told the (2) ____ Technology, Entertainment, Design global conference that a working synthetic brain can be built (3) ____ the next decade. He told his audience: "It is not impossible to build a human brain and we can do it in 10 years." He (4) ____ himself a challenge by stating that if he succeeded, he would "send a hologram to T.E.D. to talk." Professor Markham is director of the Blue Brain project, which aims (5) ____ engineer mammals' brains from laboratory data. He has already had success with creating parts of a rat's brain. Markham said the human brain was so complex, it was an "almost (6) ____ organ".

Professor Markham hoped his research would (7) ____ to new treatments for mental illnesses. He said: "There are two billion people on the planet affected by mental disorder." Markham believes synthetic brain technology will reduce the (8) ____ for experiments on animals. "We cannot keep on doing animal experiments forever," he said. This will (9) ____ many animal rights activists, who say such research is cruel. He hopes to create a kind of "Noah's Ark" of animal brain models. Professor Markham provided a simple (10) ____ of his work: "It's a bit (11) ____ going and cataloguing a bit of the rainforest...But it is a bit more than cataloguing because you have to describe and (12) ____ all the rules of communication, the rules of connectivity."

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

- | | | | | |
|-----|-----------------|-----------------|-----------------|---------------|
| 1. | (a) cutting | (b) cut | (c) cutter | (d) cuts |
| 2. | (a) annually | (b) annual | (c) year | (d) years |
| 3. | (a) out | (b) up | (c) in | (d) on |
| 4. | (a) setter | (b) setting | (c) sets | (d) set |
| 5. | (a) of | (b) by | (c) at | (d) to |
| 6. | (a) frightened | (b) afraid | (c) frightening | (d) fear |
| 7. | (a) lead | (b) iron | (c) steel | (d) tin |
| 8. | (a) necessary | (b) need | (c) needy | (d) needs |
| 9. | (a) happy | (b) glad | (c) please | (d) grateful |
| 10. | (a) explanation | (b) explanatory | (c) explained | (d) explain |
| 11. | (a) likelihood | (b) liking | (c) likely | (d) like |
| 12. | (a) discovery | (b) discover | (c) discovered | (d) discovers |

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

3. ARTIFICIAL BRAINS: Make a poster about the pros and cons of artificial brains. Show your work to your classmates in the next lesson. Did you all have similar things?

4. MONSTERS? Write a magazine article about artificial brains. Include imaginary interviews with a person who has one and a person who fears artificial brains will change us forever.

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. LETTER: Write a letter to Professor Henry Markham. Ask him three questions about his research. Give them him three ideas on what he should do next to make our brains better. Read your letter to your partner(s) in your next lesson. Your partner(s) will answer your questions.

ANSWERS

TRUE / FALSE:

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

SYNONYM MATCH:

- | | |
|-----------------|----------------|
| 1. cutting edge | a. the latest |
| 2. replica | b. copy |
| 3. synthetic | c. man-made |
| 4. complex | d. complicated |
| 5. frightening | e. scary |
| 6. treatments | f. cures |
| 7. reduce | g. cut |
| 8. activists | h. campaigners |
| 9. a bit | i. a little |
| 10. cataloguing | j. listing |

PHRASE MATCH:

- | | |
|---------------------------|---------------------------|
| 1. a cutting-edge | a. ideas conference |
| 2. close to building a | b. replica human brain |
| 3. He set himself | c. a challenge |
| 4. He has already | d. had success |
| 5. the human brain was | e. so complex |
| 6. lead to new treatments | f. for mental illnesses |
| 7. reduce the need for | g. experiments on animals |
| 8. a simple explanation | h. of his work |
| 9. it is a bit more | i. than cataloguing |
| 10. discover all the | j. rules of communication |

GAP FILL:

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Professor Markham hoped his research would **lead** to new treatments for mental illnesses. He said: "There are two billion people on the planet **affected** by mental disorder." Markham believes synthetic brain technology will reduce the **need** for experiments on animals. "We cannot keep on doing animal experiments **forever**," he said. This will please many animal **rights** activists, who say such research is cruel. He hopes to create a kind of "Noah's Ark" of animal brain models. Professor Markham provided a **simple** explanation of his work: "It's a bit like going and cataloguing a **bit** of the rainforest...But it is a bit more than cataloguing because you have to describe and discover all the rules of communication, the **rules** of connectivity."

LANGUAGE WORK

- 1 - a 2 - b 3 - c 4 - d 5 - d 6 - c 7 - a 8 - b 9 - c 10 - a 11 - d 12 - b