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Level 6

Japan finds enough rare-earth metals to last 700 years

14th April, 2018

<https://breakingnewsenglish.com/1804/180414-rare-earth-metals.html>

Contents

The Article	2	Discussion (Student-Created Qs)	15
Warm-Ups	3	Language Work (Cloze)	16
Vocabulary	4	Spelling	17
Before Reading / Listening	5	Put The Text Back Together	18
Gap Fill	6	Put The Words In The Right Order	19
Match The Sentences And Listen	7	Circle The Correct Word	20
Listening Gap Fill	8	Insert The Vowels (a, e, i, o, u)	21
Comprehension Questions	9	Punctuate The Text And Add Capitals	22
Multiple Choice - Quiz	10	Put A Slash (/) Where The Spaces Are	23
Role Play	11	Free Writing	24
After Reading / Listening	12	Academic Writing	25
Student Survey	13	Homework	26
Discussion (20 Questions)	14	Answers	27

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

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THE ARTICLE

From <https://breakingnewsenglish.com/1804/180414-rare-earth-metals.html>

Japanese researchers have discovered enough reserves of rare-earth metals (REMs) to satisfy global demand for up to 700 years. Oceanographers surveyed the deep-sea mud on the Pacific Ocean floor near Japan's Ogasawara Islands, which are about 2,000 kilometers southeast of Tokyo. Scientists say the minerals find, "has the potential to supply these metals on a semi-infinite basis to the world". Researchers from Waseda University and the University of Tokyo estimate the area they mapped contains more than 16 million tons of rare-earth metals. They added that the area offers "great potential as ore deposits for some of the most critically important elements in modern society".

A rare-earth metal is one of a set of seventeen chemical elements in the periodic table. They have what many of us would consider to be relatively unknown names, like europium, promethium scandium and terbium. The uses, applications, and demand of rare-earth elements have greatly increased with our reliance on high-tech products. They are widely used in the production of electric motors for hybrid vehicles, wind turbines, hard disc drives, portable electronics, microphones, speakers and a whole array of other products. Around 90 per cent of the world's supply of REMs used to manufacture advanced electronics currently comes from China. The discovery near Japan could bring down prices.

Sources: <https://japantoday.com/category/tech/japan-team-maps-%27semi-infinite%27-rare-earth-reserves>
<https://mainichi.jp/english/articles/20180411/p2a/00m/0na/014000c>
https://en.wikipedia.org/wiki/Rare-earth_element

WARM-UPS

1. METALS: Students walk around the class and talk to other students about metals. 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?

researchers / reserves / global demand / deep sea / minerals / potential / modern / chemicals / applications / reliance / products / hybrid / microphones / discovery

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

3. NO MINING: Students A **strongly** believe we must stop mining for minerals; Students B **strongly** believe we shouldn't. Change partners again and talk about your conversations.

4. METALS: What do you know about these metals? How useful are they? Complete this table with your partner(s). Change partners often and share what you wrote.

	What I Know	How Useful
Gold		
Aluminum		
Steel		
Copper		
Titanium		
Lead		

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

6. HI-TECH: Rank these with your partner. Put the most useful high-tech products at the top. Change partners often and share your rankings.

- hybrid vehicles
- wind turbines
- hard disc drives
- microphones
- speakers
- printers
- cameras
- X-ray machines

VOCABULARY MATCHING

Paragraph 1

- | | |
|---------------|---|
| 1. reserves | a. With decisive or crucial importance in the success, failure, or existence of something. |
| 2. satisfy | b. Stocks or supplies of a commodity not needed for immediate use but available if needed. |
| 3. surveyed | c. Having or showing the capacity to become or develop into something in the future. |
| 4. minerals | d. Meet the expectations, needs, or desires of someone. |
| 5. potential | e. A natural, solid, inorganic substance that is inside the Earth. |
| 6. infinite | f. Examine and recorded the area and features of an area of land or sea so as to construct a map, plan, or description. |
| 7. critically | g. Limitless or endless in space, extent, or size. |

Paragraph 2

- | | |
|-------------------|--|
| 8. periodic table | h. A grid that has all of the chemical elements (gold, helium, oxygen, calcium, etc.) arranged in order of atomic number, usually in rows. |
| 9. relatively | i. The action or process of finding something for the first time. |
| 10. reliance | j. In relation, comparison, or proportion to something else. |
| 11. hybrid | k. Make something on a large scale using machinery. |
| 12. array | l. Dependence on or trust in someone or something. |
| 13. manufacture | m. A thing made by combining two different elements; a mixture; a car with a gasoline engine and an electric motor. |
| 14. discovery | n. An impressive range of a particular type of thing. |

BEFORE READING / LISTENING

From <https://breakingnewsenglish.com/1804/180414-rare-earth-metals.html>

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

- a. The reserves of rare-earth metals were found in the Sea of Japan. **T / F**
- b. Researchers from Osaka universities found the reserves. **T / F**
- c. Researchers say they found over 16 million tons of rare-earth metals. **T / F**
- d. The metals aren't that important for modern society. **T / F**
- e. The periodic table contains 18 rare-earth metals. **T / F**
- f. Most of the rare-earth metals have unfamiliar names. **T / F**
- g. Rare-earth metals are used in the production of microphones. **T / F**
- h. China supplies 90% of the rare-earth metals used in advanced electronics. **T / F**

2. SYNONYM MATCH:

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

- | | |
|----------------------|------------------|
| 1. discovered | a. charted |
| 2. satisfy | b. manufacture |
| 3. estimate | c. comparatively |
| 4. mapped | d. meet |
| 5. area | e. dependence |
| 6. elements | f. unearthed |
| 7. relatively | g. presently |
| 8. reliance | h. reckon |
| 9. production | i. region |
| 10. currently | j. components |

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

- | | |
|---------------------------------------|------------------------------|
| 1. reserves | a. elements |
| 2. Oceanographers | b. important elements |
| 3. supply these metals on | c. on high-tech products |
| 4. some of the most critically | d. array of other products |
| 5. in modern | e. a semi-infinite basis |
| 6. one of a set of seventeen chemical | f. of rare-earth metals |
| 7. relatively | g. vehicles |
| 8. our reliance | h. society |
| 9. hybrid | i. unknown names |
| 10. a whole | j. surveyed the deep-sea mud |

GAP FILL

From <https://breakingnewsenglish.com/1804/180414-rare-earth-metals.html>

Japanese researchers have discovered enough (1) _____ of rare-earth metals (REMs) to (2) _____ global demand for up to 700 years. Oceanographers surveyed the deep-sea mud on the Pacific Ocean (3) _____ near Japan's Ogasawara Islands, which are about 2,000 kilometers southeast of Tokyo. Scientists say the minerals find, "has the (4) _____ to supply these metals on a semi-infinite (5) _____ to the world". Researchers from Waseda University and the University of Tokyo estimate the area they (6) _____ contains more than 16 million tons of rare-earth metals. They added that the area offers "great (7) _____ as ore deposits for some of the most critically important (8) _____ in modern society".

floor
basis
potential
reserves
satisfy
elements
potential
mapped

A rare-earth metal is one of a (9) _____ of seventeen chemical elements in the (10) _____ table. They have what many of us would consider to be (11) _____ unknown names, like europium, promethium scandium and terbium. The uses, applications, and demand of rare-earth elements have greatly increased with our (12) _____ on high-tech products. They are (13) _____ used in the production of electric motors for (14) _____ vehicles, wind turbines, hard disc drives, portable electronics, microphones, speakers and a whole (15) _____ of other products. Around 90 per cent of the world's supply of REMs used to manufacture advanced electronics currently comes from China. The (16) _____ near Japan could bring down prices.

widely
periodic
discovery
set
array
reliance
hybrid
relatively

LISTENING – Guess the answers. Listen to check.

From <https://breakingnewsenglish.com/1804/180414-rare-earth-metals.html>

- 1) enough reserves of rare-earth metals (REMs) to _____ demand
 - a. satisfied global
 - b. satisfying global
 - c. satisfies global
 - d. satisfy global
- 2) which are about 2,000 kilometers _____ Tokyo
 - a. southwestern of
 - b. southeast of
 - c. southeasterly of
 - d. southwest of
- 3) has the potential to supply these metals on a semi-_____
 - a. infinite basics
 - b. infinite bisques
 - c. infinite basis
 - d. infinite bastes
- 4) Researchers from Waseda University and the University of Tokyo estimate the area ____
 - a. they mapped
 - b. they trapped
 - c. they napped
 - d. they sapped
- 5) great potential as ore deposits for some of the most _____ elements
 - a. critically unimportant
 - b. critically imported
 - c. critically important
 - d. critically impotent
- 6) A rare-earth metal is one of a set of seventeen chemical elements in the _____
 - a. periodically table
 - b. periodic table
 - c. period table
 - d. episodic table
- 7) They have what many of us would consider to be _____ names
 - a. relatively now known
 - b. relatively I'm known
 - c. relatively onion
 - d. relatively unknown
- 8) demand of rare-earth elements have greatly increased with _____
 - a. our alliance
 - b. our reliance
 - c. our brilliance
 - d. our dalliance
- 9) They are widely used in the production of electric motors for _____
 - a. hyped vehicles
 - b. high bridge vehicles
 - c. high ridge vehicles
 - d. hybrid vehicles
- 10) world's supply of REMs used to manufacture advanced electronics _____ from China
 - a. currency comes
 - b. currants comes
 - c. currents comes
 - d. currently comes

LISTENING – Listen and fill in the gaps

From <https://breakingnewsenglish.com/1804/180414-rare-earth-metals.html>

Japanese researchers have discovered (1) _____ rare-earth metals (REMs) to satisfy (2) _____ up to 700 years. Oceanographers surveyed the deep-sea mud on the Pacific Ocean floor near Japan's Ogasawara Islands, which are about 2,000 kilometers southeast of Tokyo. Scientists say (3) _____, "has the potential to supply these metals on a (4) _____ to the world". Researchers from Waseda University and the University of Tokyo estimate the area they (5) _____ than 16 million tons of rare-earth metals. They added that the area offers "great potential as ore deposits for some of the most critically important elements (6) _____".

A rare-earth metal is one of a set of seventeen chemical elements in (7) _____. They have what many of us would consider to be relatively unknown names, like europium, promethium scandium and terbium. The uses, applications, and demand of (8) _____ have greatly increased with (9) _____ high-tech products. They are widely used in the production of electric motors (10) _____, wind turbines, hard disc drives, portable electronics, microphones, speakers and a (11) _____ other products. Around 90 per cent of the world's supply of REMs used to manufacture advanced electronics (12) _____ China. The discovery near Japan could bring down prices.

COMPREHENSION QUESTIONS

From <https://breakingnewsenglish.com/1804/180414-rare-earth-metals.html>

1. What will the reserves of rare-earth materials satisfy?
2. How far are the reserves from Tokyo?
3. How many universities took part in the mapping?
4. How much rare-earth metal is there?
5. Where are these metals critically important?
6. How many rare-earth metals are there in the periodic table?
7. What did the article say about the names of rare-earth metals?
8. What has increased the demand for rare-earth metals?
9. What kind of vehicles were mentioned in the article?
10. What could the discovery in Japan help to bring down?

MULTIPLE CHOICE - QUIZ

From <https://breakingnewsenglish.com/1804/180414-rare-earth-metals.html>

- 1) What will the reserves of rare-earth materials satisfy?
 - a) oceanographers
 - b) appetites
 - c) global demand
 - d) electronics stores
- 2) How far are the reserves from Tokyo?
 - a) about 2,000 kilometers
 - b) over 2,000 kilometers
 - c) just under 2,000 kilometers
 - d) exactly 2,000 kilometers
- 3) How many universities took part in the mapping?
 - a) 5
 - b) 4
 - c) 3
 - d) 2
- 4) How much rare-earth metal is there?
 - a) less than 16 million tons
 - b) more than 16 million tons
 - c) exactly 16 million tons
 - d) about than 16 million tons
- 5) Where are these metals critically important?
 - a) in profit and loss accounts
 - b) in Botswana
 - c) in modern society
 - d) in mobile phones
- 6) How many rare-earth metals are there in the periodic table?
 - a) 16
 - b) 17
 - c) 18
 - d) 19
- 7) What did the article say about the names of rare-earth metals?
 - a) they all come from Greek
 - b) they are difficult to pronounce
 - c) they are named after scientists
 - d) they are relatively unknown
- 8) What has increased the demand for rare-earth metals?
 - a) the Internet
 - b) our need for high-tech
 - c) global warming
 - d) a shortage of iron
- 9) What kind of vehicles were mentioned in the article?
 - a) hybrid vehicles
 - b) polluting vehicles
 - c) driverless vehicles
 - d) space-age vehicles
- 10) What could the discovery in Japan help to bring down?
 - a) tariffs
 - b) barriers
 - c) competition
 - d) prices

ROLE PLAY

From <https://breakingnewsenglish.com/1804/180414-rare-earth-metals.html>

Role A – Hybrid Vehicles

You think hybrid vehicles are the most useful things. Tell the others three reasons why. Tell them what is wrong with their things. Also, tell the others which is the least useful of these (and why): wind turbines, hard disc drives or X-ray machines.

Role B – Wind Turbines

You think wind turbines are the most useful things. Tell the others three reasons why. Tell them what is wrong with their things. Also, tell the others which is the least useful of these (and why): hybrid vehicles, hard disc drives or X-ray machines.

Role C – Hard Disc Drives

You think hard disc drives are the most useful things. Tell the others three reasons why. Tell them what is wrong with their things. Also, tell the others which is the least useful of these (and why): wind turbines, hybrid vehicles or X-ray machines.

Role D – X-Ray Machines

You think X-ray machines are the most useful things. Tell the others three reasons why. Tell them what is wrong with their things. Also, tell the others which is the least useful of these (and why): wind turbines, hard disc drives or hybrid vehicles.

AFTER READING / LISTENING

From <https://breakingnewsenglish.com/1804/180414-rare-earth-metals.html>

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

rare	earth
-------------	--------------

- 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">• enough• deep• 2,000• basis• 16• modern	<ul style="list-style-type: none">• 17• names• uses• motors• 90• prices
---	--

METALS SURVEY

From <https://breakingnewsenglish.com/1804/180414-rare-earth-metals.html>

Write five GOOD questions about metals 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.

METALS 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 'earth'?
3. What do you know about rare-earth metals?
4. What other useful stuff might be in or under the oceans?
5. What will we be making with these materials in 700 years?
6. What is the world's most useful metal?
7. Does mining rare-earth materials damage the Earth?
8. What do you think an oceanographer does?
9. Why are REMs so critically important?
10. What would happen if we ran out of minerals?

Japan finds enough rare-earth metals to last 700 years – 14th April, 2018
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METALS 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 'metal'?
13. What do you think about what you read?
14. What do you know about the periodic table?
15. What high-tech products do you rely on most?
16. What do you know about hybrid vehicles?
17. What do you know about wind turbines?
18. How will scientists get the metals from the ocean floor?
19. Could you live without high-tech products?
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/1804/180414-rare-earth-metals.html>

Japanese researchers have discovered enough (1) _____ of rare-earth metals (REMs) to (2) _____ global demand for up to 700 years. Oceanographers surveyed the deep-sea mud on the Pacific Ocean floor near Japan's Ogasawara Islands, which are about 2,000 kilometers southeast of Tokyo. Scientists say the minerals find, "has the potential to supply these metals on a semi-(3)_____ basis to the world". Researchers from Waseda University and the University of Tokyo estimate the area they (4) _____ contains more than 16 million tons of rare-earth metals. They added that the area offers "great potential as (5) _____ deposits for some of the most (6) _____ important elements in modern society".

A rare-earth metal is one of a set of seventeen chemical elements in the (7) _____ table. They have what many of us would consider to be (8) _____ unknown names, like europium, promethium scandium and terbium. The uses, applications, and demand of rare-earth elements have greatly increased with our reliance (9) _____ high-tech products. They are widely used in the production of electric motors for (10) _____ vehicles, wind turbines, hard disc drives, portable electronics, microphones, speakers and a whole (11) _____ of other products. Around 90 per cent of the world's supply of REMs used to manufacture advanced electronics currently comes from China. The discovery near Japan could (12) _____ down prices.

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

- | | | | | |
|-----|----------------|---------------|----------------|------------------|
| 1. | (a) reverses | (b) reserves | (c) severs | (d) servings |
| 2. | (a) Spotify | (b) satisfy | (c) specify | (d) pacify |
| 3. | (a) ingratiate | (b) ignite | (c) indefinite | (d) infinite |
| 4. | (a) lapped | (b) mapped | (c) gapped | (d) sapped |
| 5. | (a) shore | (b) ore | (c) or | (d) awe |
| 6. | (a) crucial | (b) critical | (c) critically | (d) cruciate |
| 7. | (a) period | (b) periods | (c) periodic | (d) periodically |
| 8. | (a) relatives | (b) relations | (c) relatively | (d) related |
| 9. | (a) at | (b) to | (c) in | (d) on |
| 10. | (a) hybrid | (b) rabid | (c) inbred | (d) tepid |
| 11. | (a) array | (b) ray | (c) awry | (d) away |
| 12. | (a) have | (b) turn | (c) bring | (d) go |

SPELLING

From <https://breakingnewsenglish.com/1804/180414-rare-earth-metals.html>

Paragraph 1

1. rseesver of rare-earth metals
2. Oceanographers rdevsuey the deep-sea mud
3. on a semi-tiinnfie basis
4. etimtsea the area
5. great ttoeanipl as ore deposits
6. the most tlilcycria important

Paragraph 2

7. a set of seventeen chemical etsenlme
8. in the eiircpod table
9. retlivayle unknown names
10. our eciranle on high-tech products
11. rihdyb vehicles
12. aaremutucnf advanced electronics

PUT THE TEXT BACK TOGETHER

From <https://breakingnewsenglish.com/1804/180414-rare-earth-metals.html>

Number these lines in the correct order.

- () on high-tech products. They are widely used in the production of electric motors for hybrid vehicles, wind
- () potential to supply these metals on a semi-infinite basis to the world". Researchers from Waseda University
- (**1**) Japanese researchers have discovered enough reserves of rare-earth metals (REMs) to satisfy global demand
- () for up to 700 years. Oceanographers surveyed the deep-sea mud on the Pacific Ocean
- () A rare-earth metal is one of a set of seventeen chemical elements in the periodic
- () and the University of Tokyo estimate the area they mapped contains more than 16 million
- () turbines, hard disc drives, portable electronics, microphones, speakers and a whole array of other
- () deposits for some of the most critically important elements in modern society".
- () products. Around 90 per cent of the world's supply of REMs used to manufacture
- () floor near Japan's Ogasawara Islands, which are about 2,000 kilometers southeast of Tokyo. Scientists say the minerals find, "has the
- () advanced electronics currently comes from China. The discovery near Japan could bring down prices.
- () tons of rare-earth metals. They added that the area offers "great potential as ore
- () and terbium. The uses, applications, and demand of rare-earth elements have greatly increased with our reliance
- () table. They have what many of us would consider to be relatively unknown names, like europium, promethium scandium

PUT THE WORDS IN THE RIGHT ORDER

From <https://breakingnewsenglish.com/1804/180414-rare-earth-metals.html>

1. 700 Satisfy up years . for global to demand
2. Deep-sea the floor . Pacific mud Ocean on
3. these metals basis . a Supply on semi-infinite
4. more . estimate contains Researchers mapped they area the
5. modern in elements most important The critically society .
6. elements Seventeen the periodic in chemical table .
7. motors for of The vehicles . electric production hybrid
8. of supply the Around REMs . 90% of world's
9. to electronics . REMs manufacture advanced used
10. down near Japan The prices . bring discovery could

CIRCLE THE CORRECT WORD (20 PAIRS)

From <https://breakingnewsenglish.com/1804/180414-rare-earth-metals.html>

Japanese researchers have discovered *plenty / enough* reserves of rare-earth metals (REMs) to *satisfy / satisfaction* global demand for up to 700 years. Oceanographers surveyed the deep-sea *dirt / mud* on the Pacific Ocean *ceiling / floor* near Japan's Ogasawara Islands, which are about 2,000 kilometers *southeast / southern* of Tokyo. Scientists say the minerals find, "has the *potential / potent* to supply these metals on a semi-infinite *basic / basis* to the world". Researchers from Waseda University and the University of Tokyo estimate the area they *lapped / mapped* contains more than 16 million *tins / tons* of rare-earth metals. They added that the area offers "great potential as ore deposits for some of the most *criticized / critically* important elements in modern society".

A rare-earth metal is one of a set of seventeen chemical elements in the *periodic / period* table. They have what many of us would *consider / considering* to be *relatively / relative* unknown names, like europium, promethium scandium and terbium. The uses, applications, and *demand / demanded* of rare-earth elements have greatly increased *to / with* our reliance on high-tech products. They are *width / widely* used in the production of electric motors for *hybrid / rabid* vehicles, wind turbines, hard disc drives, portable electronics, microphones, speakers and a *whole / hole* array of other products. Around 90 per cent of the world's supply of REMs used to manufacture *advancing / advanced* electronics currently comes from China. The discovery near Japan could *bring / go* down prices.

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/1804/180414-rare-earth-metals.html>

J_p_n_s_ r_s__ r c h_r s h_v_ d_s c_v_r_d _n__ g h
r_s_r v_s _f r_r-__ rth m_t_l_s (R E M_s) t_ s_t_s
f_y g_l_b_l d_m_n_d f_r _p t_ 7 0 0 y__ r_s . O c__
n_g_r_p_h_r_s s_r_v_y_d th_ d__ p - s__ m_d _n th_
P_c_f_c O c__ n f_l__ r n__ r J_p_n 's O g_s_w_r_s
l_n_d_s , w_h_c_h _r _b__ t 2 , 0 0 0 k_l_m_t_r_s s__
t_h__ s_t _f T_k_y_ . S c__ n_t_s_t_s s_y th_ m_n_r_l
s f_n_d , " h_s th_ p_t_n_t__ l t_ s_p_p_l_y th_s_
m_t_l_s _n _ s_m_-n_f_n_t b_s_s t_ th_ w_r_l_d " .
R_s__ r c h_r s f_r_m W_s_d_ U_n_v_r_s_t_y _n_d th_
U_n_v_r_s_t_y _f T_k_y_ _s_t_m_t_ th_ _r__ th_y m_p
p_d c_n_t__ n_s m_r_ th_n 16 m_l_l__ n_t_n_s _f
r_r-__ rth m_t_l_s . Th_y _d_d_d th_t th_ _r__
_f_f_r_s " g_r__ t p_t_n_t__ l _s _r_ d_p_s_t_s f_r
s_m_ _f th_ m_s_t c_r_t_c_l_l_y _m_p_r_t_n_t _l_m_n_t_s
_n m_d_r_n s_c__ t_y " .

A r_r-__ rth m_t_l_s _n _f _s_t _f s_v_n_t__ n
c_h_m_c_l _l_m_n_t_s _n th_ p_r__ d_c t_b_l_ . Th_y
h_v_ w_h_t m_n_y _f _s w__ l_d c_n_s_d_r t_ b_
r_l_t_v_l_y _n_k_n_w_n n_m_s , l_k_ __ r_p__ m , p
r_m_th__ m s_c_n_d__ m _n_d t_r_b__ m . Th_ _s_s ,
_p_p_l_c_t__ n_s , _n_d d_m_n_d _f r_r-__ rth _l_m_n
t_s h_v_ g_r__ t_l_y _n_c_r__ s_d w_th __ r_r_l__ n_c_
_n h_g_h - t_c_h p_r_d_c_t_s . Th_y _r_ w_d_l_y _s_d
n th p_r_d_c_t__ n _f _l_c_t_r_c m_t_r_s f_r h_y_b
r_d v_h_c_l_s , w_n_d t_r_b_n_s , h_r_d d_s_c_d
r_v_s , p_r_t_b_l_ _l_c_t_r_n_c_s , m_c_r_p_h_n_s , s_p__
k_r_s _n_d _ w_h_l_ _r_r_y _f _t_h_r_ p_r_d_c_t_s . A
r__ n_d 90 p_r c_n_t _f th_ w_r_l_d 's s_p_p_l_y _f
R E M_s _s_d t_ m_n_f_c_t_r_ d_v_n_c_d _l_c_t_r_n_c_s
c_r_r_n_t_l_y c_m_s f_r_m C_h_n_ . Th_ d_s_c_v_r_y
n__ r J_p_n c__ l_d b_r_n_g d_w_n p_r_c_s .

PUNCTUATE THE TEXT AND ADD CAPITALS

From <https://breakingnewsenglish.com/1804/180414-rare-earth-metals.html>

japanese researchers have discovered enough reserves of rareearth metals
rems to satisfy global demand for up to 700 years oceanographers surveyed
the deepsea mud on the pacific ocean floor near japans ogasawara Islands
which are about 2000 kilometers southeast of tokyo scientists say the
minerals find has the potential to supply these metals on a semiinfinite basis
to the world researchers from waseda University and the university of tokyo
estimate the area they mapped contains more than 16 million tons of
rareearth metals they added that the area offers great potential as ore
deposits for some of the most critically important elements in modern
society

a rareearth metal is one of a set of seventeen chemical elements in the
periodic table they have what many of us would consider to be relatively
unknown names like europium promethium scandium and terbium the uses
applications and demand of rareearth elements have greatly increased with
our reliance on hightech products they are widely used in the production of
electric motors for hybrid vehicles wind turbines hard disc drives portable
electronics microphones speakers and a whole array of other products
around 90 per cent of the worlds supply of rems used to manufacture
advanced electronics currently comes from china the discovery near japan
could bring down prices

PUT A SLASH (/) WHERE THE SPACES ARE

From <https://breakingnewsenglish.com/1804/180414-rare-earth-metals.html>

Japanese researchers have discovered enough reserves of rare-earth metals (REMs) to satisfy global demand for up to 700 years. Oceanographers surveyed the deep-sea mud on the Pacific Ocean floor near Japan's Ogasawara Islands, which are about 2,000 kilometers southeast of Tokyo. Scientists say the minerals found "has the potential to supply these metals on a semi-infinite basis to the world". Researchers from Waseda University and the University of Tokyo estimate the area they mapped contains more than 16 million tons of rare-earth metals. They added that the area offers "great potential as ore deposits for some of the most critically important elements in modern society". A rare-earth metal is one of a set of seventeen chemical elements in the periodic table. They have what many of us would consider to be relatively unknown names, like europium, promethium, scandium and terbium. The uses, applications, and demand for rare-earth elements have greatly increased with our reliance on high-tech products. They are widely used in the production of electric motors for hybrid vehicles, wind turbines, hard disc drives, portable electronics, microphones, speakers and a whole array of other products. Around 90 percent of the world's supply of REMs used to manufacture advanced electronics currently comes from China. The discovery near Japan could bring down prices.

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

4. MINERALS: Write a magazine article about cutting our use of minerals to protect the Earth. 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 metals. Ask him/her three questions about them. Give him/her three of your opinions on the mining of rare-earth metals. Read your letter to your partner(s) in your next lesson. Your partner(s) will answer your questions.

ANSWERS

VOCABULARY (p.4)

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

TRUE / FALSE (p.5)

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

SYNONYM MATCH (p.5)

- | | |
|---------------|------------------|
| 1. discovered | a. unearthed |
| 2. satisfy | b. meet |
| 3. estimate | c. reckon |
| 4. mapped | d. charted |
| 5. area | e. region |
| 6. elements | f. components |
| 7. relatively | g. comparatively |
| 8. reliance | h. dependence |
| 9. production | i. manufacture |
| 10. currently | j. presently |

COMPREHENSION QUESTIONS (p.9)

- Global demand
- About 2,000km
- Two
- Over 16 million tons
- In modern society
- 17
- They are relatively unknown
- Our reliance on high-tech products
- Hybrid vehicles
- Prices

WORDS IN THE RIGHT ORDER (p.20)

- Satisfy global demand for up to 700 years.
- Deep-sea mud on the Pacific Ocean floor.
- Supply these metals on a semi-infinite basis.
- Researchers estimate the area they mapped contains more.
- The most critically important elements in modern society.
- Seventeen chemical elements in the periodic table.
- The production of electric motors for hybrid vehicles.
- Around 90% of the world's supply of REMs.
- REMs used to manufacture advanced electronics.
- The discovery near Japan could bring down prices.

MULTIPLE CHOICE - QUIZ (p.10)

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 ;-)