U.S.-China trade: what are rare-earth metals and what's the dispute?

By Kalyeena Makortoff, The Guardian on 04.14.19
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Mountain Pass is the only rare-earth mine in the U.S. The mine produces rare-earth extract that are exported to China for processing. Photo by Don Bartletti/Los Angeles Times via Getty Images

**What are rare-earth metals?**

Rare earths refer to a group of 17 elements that are prized for their unique magnetic and electrochemical properties.

They include elements such as gadolinium, lanthanum, cerium and promethium, and are vital in the production of cancer treatment drugs, smartphones and renewable energy technologies.

The elements have been designated as "critical" by the U.S. Geological Survey for sectors including national defense.

**Where do they come from?**

Rare earths are not actually very rare. They can be found across the Earth's crust. However, they are often in low concentrations and are difficult and expensive to mine.
The process can also damage the environment, with ecosystems put at risk by pit mining, the release of metal byproducts from refineries, and water contamination from particles being dumped during waste disposal.

China is by far the world's largest producer of rare earths and accounts for about 70 percent of global production. The country has some 37 percent of global reserves.

**How did rare earths get caught up in the U.S.-China trade war?**

Beijing has been looking for further leverage in its trade war with the U.S., which escalated earlier this month when Donald Trump announced he was increasing tariffs on $200 billion of Chinese goods from 10 percent to 25 percent.

While China retaliated with tariffs on $60 billion of goods it imports from the U.S., including spinach, batteries and coffee, Chinese newspapers have signaled that its next move could be the restriction of rare earths.

It would be a blow to the White House, as the U.S. relied on China for about 80 percent of its rare-earth imports between 2014 and 2017.

The editor of the state-controlled "Global Times," Hu Xijin, tweeted: "Based on what I know, China is seriously considering restricting rare-earth exports to the U.S. China may also take other countermeasures in the future."

**What are they used for?**

The use of rare earths is vast and varied, spanning national defense to consumer goods.

They are used in health care, including for surgical supplies, pacemakers, cancer treatment drugs and rheumatoid arthritis medication. They are also found in telescope lenses, aircraft engines and are used as catalysts in auto exhaust systems to help reduce emissions.

Neodymium is often used to produce high-powered, infrared lasers for national defense, while military suppliers such as BAE systems use rare earths to produce sensors for missile systems.

**Which consumer products are at risk?**

Rare-earth elements have helped make consumer electronics such as computers and smartphones lighter, smaller and more efficient.

The consumer goods giant Apple, for example, is dependent on rare earths for component parts including cameras and speakers, and says the elements are hard to recover in the recycling process because they appear in such small quantities in the original products.

They are also required for rechargeable batteries used in electric cars and are used in the manufacture of televisions.

**Are there other countries that can step in to cover China's supply?**

Countries last tried to cut their dependence back in 2010 during a dispute between China and Japan. Tokyo accused Beijing of halting supplies for political reasons. While rare-earths mines are
also found in Malaysia, Brazil, Estonia, Australia, India, South Africa and Canada, few alternative suppliers were able to fill the gap.

The U.S. has a single rare-earth mine in operation, based in California. The Mountain Pass mine exports about 50,000 tons of rare-earth extract to China for processing.

However, Australian company Lynas signed an agreement earlier this month with the Texas-based chemicals manufacturer Blue Line to build a processing plant in the U.S.

Some companies, such as Nebraska's Rare Earth Salts, are reportedly recycling fluorescent light tubes for rare-earth elements that make up about 20 percent of the bulb.

**Which companies are benefiting from the threats?**

A number of rare-earths companies have seen their share prices soar, as markets anticipate a surge in demand and higher prices, as a result of restricted Chinese supply.

Shares in Rainbow Rare Earths, which is listed on London's alternative investment market, jumped nearly 15 percent on Wednesday amid fresh trade threats, while China Rare Earth Holdings ended the day up 24 percent in Hong Kong.
1. Read the final two paragraphs of the article.

What is the MOST LIKELY reason the author chose to conclude the article with these paragraphs?

(A) to indicate a contrast between the success of rare-earth companies in London and Hong Kong
(B) to elaborate on the effects that the trade war is already having on some businesses
(C) to emphasize that most of the worries now associated with the trade war are unfounded
(D) to illustrate that some companies have purposely exaggerated the threat of a trade war

2. Read the following sentences from the section "Are there other countries that can step in to cover China's supply?"

While rare-earths mines are also found in Malaysia, Brazil, Estonia, Australia, India, South Africa and Canada, few alternative suppliers were able to fill the gap.

Some companies, such as Nebraska's Rare Earth Salts, are reportedly recycling fluorescent light tubes for rare-earth elements that make up about 20 percent of the bulb.

Which answer choice BEST describes the relationship between the two sentences?

(A) They present a problem with the supply of rare earths and an attempted solution.
(B) They present a contrast between rare-earths mining in the United States and other countries.
(C) They present events related to the increased mining of rare earths in chronological order.
(D) They present effects of the gap in rare-earths supply and the way businesses caused it.

3. Read the following paragraph from the section "How did rare earths get caught up in the U.S.-China trade war?"

The editor of the state-controlled "Global Times," Hu Xijin, tweeted: "Based on what I know, China is seriously considering restricting rare-earth exports to the U.S. China may also take other countermeasures in the future."

Which words and phrases from the section help to explain what Hu Xijin means by "countermeasures"?

(A) further; announced; imports from
(B) leverage; retaliated; next move
(C) tariffs; signaled; relied on China
(D) escalated; increasing; rare earths

4. Read the following words and phrases from the article.

1. unique
2. critical
3. expensive
4. vast and varied

WHY does the author use these words and phrases?

(A) to convey an understanding of the business jargon related to the consumer economy
(B) to convey a sense of urgency regarding the significance of the supply of rare earths
(C) to convey a sense of awe for the natural wonders that are abundant in the earth
(D) to convey an understanding of the scientific and technical aspects of rare earths
Which answer choice provides an accurate and objective summary of the article?

(A) Rare earths are elements that are extremely difficult to locate in the Earth's crust. China has mostly taken control of mining and producing these metals for the global supply chain. A dispute between Japan and China shows that a trade war over rare earths is a bad idea.

(B) Rare earths are metals that appear in the Earth's crust in most countries of the world. A trade war with China would make it difficult for America to produce missiles. The metals are also required for rechargeable batteries used in electric cars and the manufacture of televisions.

(C) Rare earths are metals that appear in many household products used by people every day. If Americans hope to succeed in a trade war with China, they will have to reduce their reliance on products that contain rare earths. One good way to achieve this is through recycling.

(D) Rare earths are elements that are valued for their unusual and specific properties. Most of the world's supply is produced and controlled by China. This means that a trade war could make it difficult to get supplies necessary to manufacture many consumer and defense products.

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Read the analysis of how the central idea is introduced.

The central idea is introduced by describing the role of rare-earth metals in many common products and the difficulty of mining them.

How is the CENTRAL idea developed further?

(A) It is developed by elaborating on the specific challenges that Chinese companies overcame to mine rare earths.

(B) It is developed by providing evidence that new technology from China has made mining rare earths easier.

(C) It is developed by providing information about how the trade war with China could affect access to rare earths.

(D) It is developed by elaborating on the relationship between Chinese companies and rare-earths consumer Apple.

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Read the following statement.

It would be difficult and time-consuming to safely expand mining of rare-earth metals in the United States.

Which selection from the article BEST supports the statement above?

(A) They include elements such as gadolinium, lanthanum, cerium and promethium, and are vital in the production of cancer treatment drugs, smartphones and renewable energy technologies.

(B) The process can also damage the environment, with ecosystems put at risk by pit mining, the release of metal byproducts from refineries, and water contamination from particles being dumped during waste disposal.

(C) Neodymium is often used to produce high-powered, infrared lasers for national defense, while military suppliers such as BAE systems use rare earths to produce sensors for missile systems.

(D) The U.S. has a single rare-earth mine in operation, based in California. The Mountain Pass mine exports about 50,000 tons of rare-earth extract to China for processing.
Is the author suggesting that people could be without products they need to survive if companies lack access to rare-earth metals? Which selection from the article supports your answer?

(A) Yes; “The elements have been designated as ‘critical’ by the U.S. Geological Survey for sectors including national defense.”

(B) No; “Rare earths are not actually very rare. They can be found across the Earth’s crust.”

(C) Yes; “They are used in health care, including for surgical supplies, pacemakers, cancer treatment drugs and rheumatoid arthritis medication.”

(D) No; “Rare-earth elements have helped make consumer electronics such as computers and smartphones lighter, smaller and more efficient.”