NAME _____

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WEB & WIRELESS TECH

Marian Croak

Turning Voices Into Data Packets

The Engineering of Internet Calling

Dr. Marian Croak, born in 1955, is an American engineer who helped change the way the world communicates. She is a pioneer of Voice over Internet Protocol, or VoIP, the technology that lets people make voice calls over the internet instead of over traditional telephone lines.

To send a voice over the internet, VoIP converts the sounds of your voice into small pieces of digital information called data packets. These packets travel across the internet and are reassembled into sound on the other end. This same idea powers the video calls and internet calling apps that billions of people use today.

Croak holds more than 200 patents, and about 135 of them are related to VoIP. A patent is an official record naming someone as the inventor of a new idea. She also invented 'text-to-donate,' a system that lets people give money to charity by texting a short code. It was used widely to raise money after disasters such as Hurricane Katrina in 2005 and the 2010 earthquake in Haiti.

Croak spent decades working at AT&T before becoming a Vice President of Engineering at Google, where she has led teams including one focused on Responsible AI. In 2022 she was inducted into the National Inventors Hall of Fame, becoming one of the few Black women to receive that honor.

Part 1 · Reading Comprehension

1. What is VoIP, and how is it different from a traditional phone call?

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2. How does VoIP send your voice across the internet?

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3. How many of Croak's patents are related to VoIP, and what is a patent?

4. What is text-to-donate, and when was it used?

Part 2 · Critical Thinking

VoIP breaks your voice into many small data packets instead of sending it as one long signal. Why might sending information in small packets be a useful way to move data across the internet?

Part 3 · STEM Challenge

Text-to-Donate Math

After a disaster, a charity sets up a text-to-donate campaign. Every time someone texts the short code, they donate $10.

1. If 300 people each text a $10 donation, how much money is raised? (300 × $10)
2. If 8,000 people each text a $10 donation, how much money is raised? (8,000 × $10)
3. The charity's goal is to raise $500,000. At $10 per text, how many text donations are needed? ($500,000 ÷ $10)
4. If 8,000 people text on the first day and 12,000 people text on the second day, all at $10 each, how much is raised over the two days? ((8,000 + 12,000) × $10)