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**Can Whitening the Clouds Stop Global Warming? Scientists Want to Try Due: Friday, Oct. 2nd**

By San Jose Mercury News, adapted by Newsela staff on 09.10.15 Word Count 899

A group of scientists are working together on a new device to help reduce climate change. This is no ordinary group though. The team is made up of retired engineers and scientists from Silicon Valley, the area near San Francisco, California, known for high-tech companies like Apple and Google. The members of the team range in age from 60 to 79 years and are trying to do something that has never been done. They hope to build a "cloud-whitener." The device is designed to help cool the temperature of the planet. It has not been tested, but the cloud-whitener would hurl tiny seawater droplets into the sky. The droplets help increase the brightness of clouds that would then reflect rays of sunlight back into space.

**Will "Geoengineering" Work?**

The team is part of a new branch of science called "geoengineering," which refers to when scientists try to change the Earth's natural systems to curb climate change. Scientist Jack Foster, age 79, says they do not want to use it unless it is necessary. Their goal is to have something available "so we know what works and what doesn’t work.” Geoengineering is controversial and many people do not support attempts to alter nature. Opinions are beginning to change though. Scientists have always said the best way to fight climate change was to reduce the use of fossil fuels like gas, oil and coal. Burning these fuels emits more carbon dioxide into the atmosphere, and this is warming the planet. But now, scientists say that even if the world could stop using fossil fuels soon, global warming will happen anyway. Critics of geoengineering, however, warn against altering nature’s patterns. They argue that we do not fully understand how to do it safely yet and worry that if people see a quick fix for climate change, they may not try as hard to reduce greenhouse gas emissions.

**"We've Got To Preserve The Future"**

“Personally, I doubt that the world is ready for this,” said Stephen Gardiner, a University of Washington professor who studies environmental policies. He says geoengineering raises difficult questions. The Silicon Valley scientists say the world might not have a choice. “We need to research the technology,” said 74-year-old project leader Armand Neukermans. None of the men will be alive by the end of this century. By then the concentration of carbon dioxide in the atmosphere is expected to be double what it is now. Temperatures are likely to be so high they will harm ecosystems and human health and welfare. They may not be around to see it but all of them "have children or grandchildren,” Neukermans said. “We’ve got to preserve the future.”

**Testing An Invention: More Fun Than Golf**

The cloud-brightening idea was first proposed in 1990 by British scientist John Latham, in an article in Nature magazine called “Control of global warming?” More than 20 years later, scientists are starting to take the idea more seriously. As of now, no one has successfully brightened a cloud. Tests have been done in labs and computers, which can only demonstrate so much. In order to know if this new approach could actually work, a real open-air trial is needed. The project seemed like a worthy challenge for longtime friends who’d rather invent things than play golf. It all started back in 2006. A meeting between Latham and top atmospheric scientists led to the team being put together under Neukermans’ leadership. They received $300,000 from the Fund for Innovative Climate and Energy Research, a group supported by former Microsoft CEO Bill Gates.

**My Buddy Has A Gadget We Can Borrow**

To acquire the tools they needed the team had to "beg, borrow and steal,” said retired pharmaceutical chemist Gary Cooper. Some tools come from the University of Washington, others from NASA and Stanford University. A lot come from their own garages. “We couldn’t do what we’re doing, if not in the heart of Silicon Valley,” Cooper said. “Everything we need is next door, or we know somebody who has it.” Through a process of trial and error, the scientists are designing and building a faucet that releases particles small enough to rise and remain hung in the air. To give an idea of just how small the particles are, they would measure about one tenth the size of the period at the end of this sentence. The team are making progress but they may have difficulty finding the funding they need to keep the expensive project going. The next phase of the project is a small, land-based experiment in California, planned for next year. It would cost about $6 million.

**Cooling Off Redwoods And Coral**

Phase Three will be conducted out at sea. Blowers will be mounted on a small ship, propelling droplets that reach real clouds. This is scheduled for 2018 or 2019 and would cost about $10 million. The technology could be used for creating fog to cool stressed redwood forests or overheated coral reefs. Scientists are also talking about even bigger uses. To help with global climate change would mean injecting droplets more than 10 miles into the sky. The plan is ambitious and highly controversial. The scientists say there will be deep satisfaction if their project succeeds. A future without global warming would be far better though. “We would be perfectly happy,” Cooper said, “if our method works beautifully — and it never needs to be used.

**1. Which of the following answer choices is a MAIN idea in the article?**

(A) It all started back in 2006. A meeting between Latham and top atmospheric scientists led to the team being put together under Neukermans’ leadership. They received $300,000 from the Fund for Innovative Climate and Energy Research, a group supported by former Microsoft CEO Bill Gates.

(B) Through a process of trial and error, the scientists are designing and building a faucet that releases particles small enough to rise and remain hung in the air. To give an idea of just how small the particles are, they would measure about one-tenth the size of the period at the end of this sentence.

(C) Scientists are also talking about even bigger uses. To help with global climate change would mean injecting droplets more than 10 miles into the sky. The plan is ambitious and highly controversial.

(D) The scientists say there will be deep satisfaction if their project succeeds. A future without global warming would be far better though.

**2. Which of the following are two CENTRAL ideas of the article?**

*1. The cloud whitener team had to do a lot to acquire the tools they needed for the project.*

*2. The cloud whitener could be used to help the environment like cooling the redwood forests in California.*

*3. The scientists want to create new technology that could help prevent the effects of global warming for future generations.*

*4. Many people are suspicious about the possible ramifications of delving into geoengineering and altering nature's patterns.*

(A) 1 and 2

(B) 2 and 3

(C) 1 and 3

(D) 3 and 4

**3. What was NOT the event that led to the scientists exploring the invention of the cloud whitener?**

(A) an article in a magazine

(B) increased temperatures around the world

(C) a desire to create technology like Apple and Google

(D) the possibility of the increased of carbon dioxide in the air

**4. Based on the section "My Buddy Has A Gadget We Can Borrow," which of the following statements is TRUE?**

(A) NASA fully supports the project.

(B) The team has solved the funding problem.

(C) The team has convinced the government to give $6 million.

(D) This project would be harder to complete outside of California.