

# The Secret of How Cacti Absorb Carbon Dioxide: ~An Easy Way to Help the Environment!~

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# SDGs and Goals

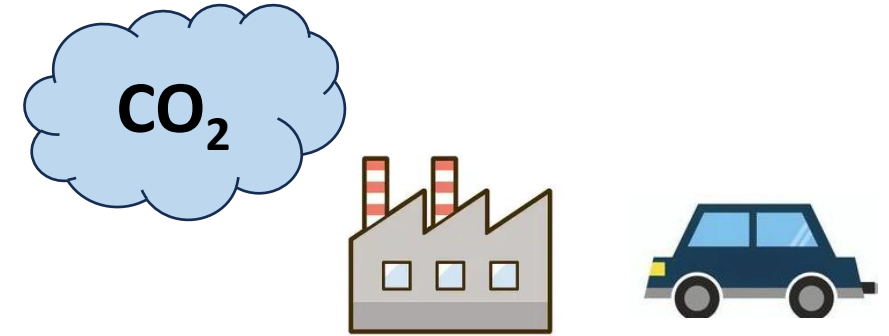


# Research Background

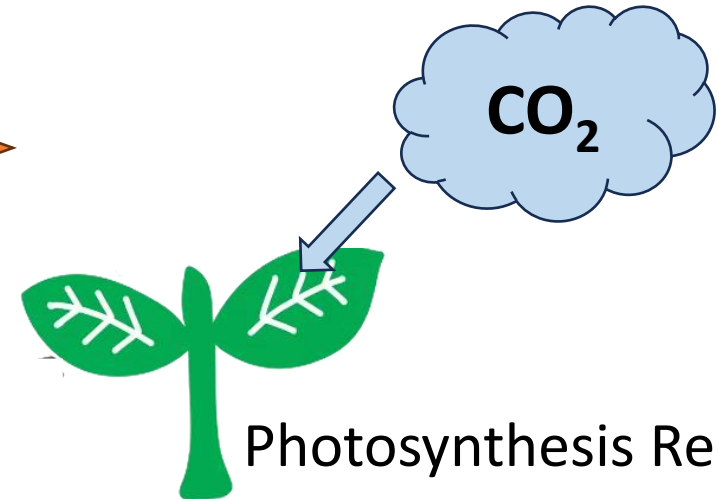
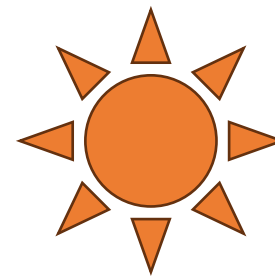
## Climate Change



## Main Causes



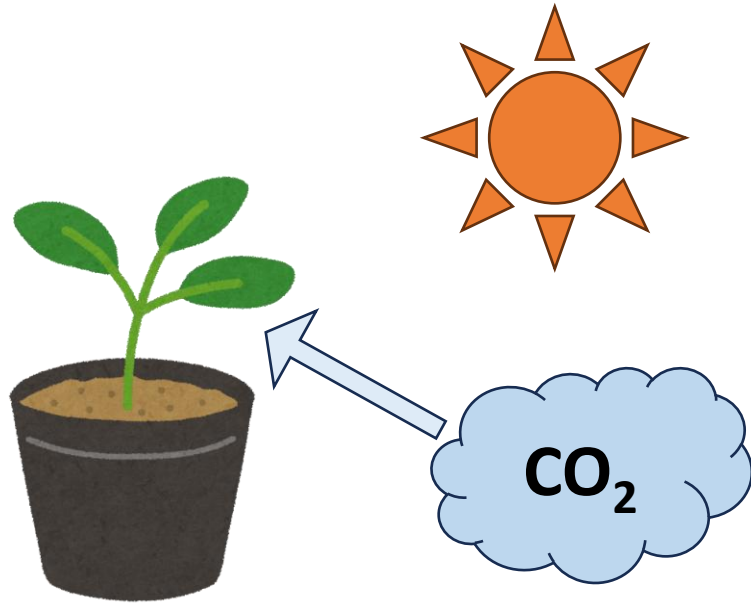
Focus on Plant  
Photosynthesis!



Photosynthesis Reduces CO<sub>2</sub>  
in the Atmosphere!

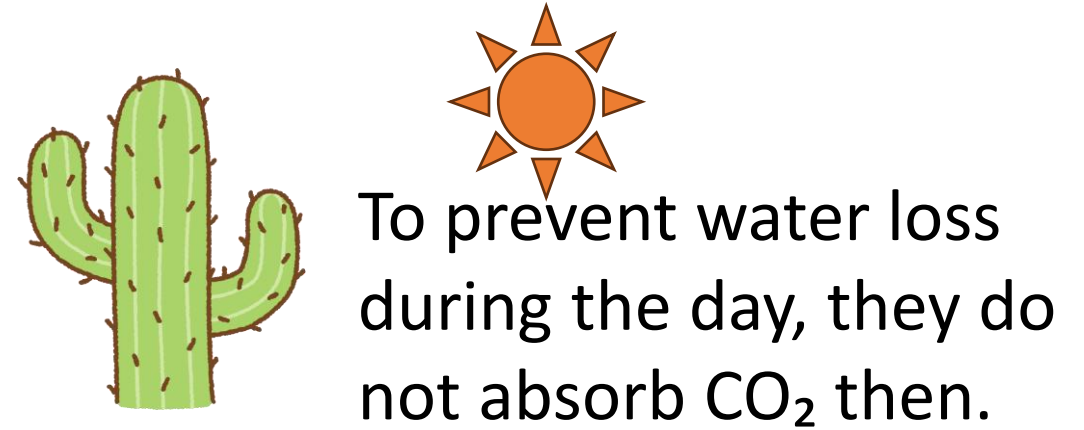
# Evolution of Photosynthesis

## Ordinary Plants (C3 and C4 Plants)

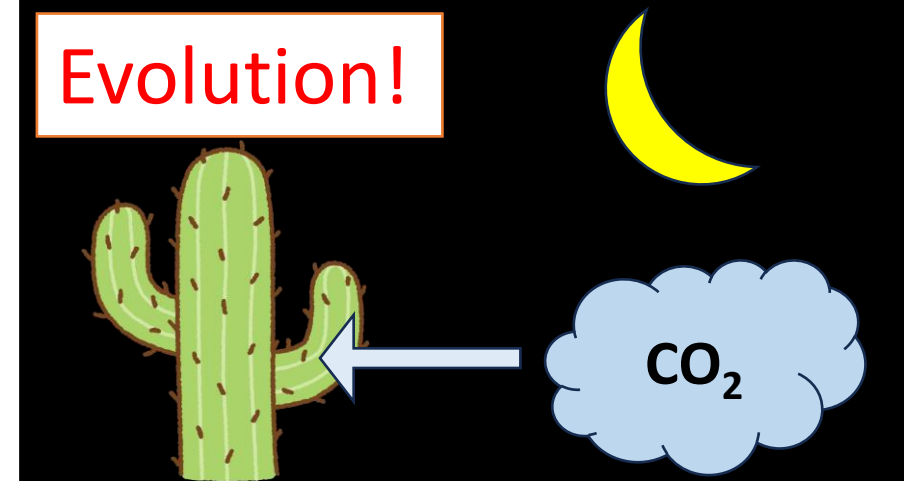


They perform photosynthesis and absorb CO<sub>2</sub> during the day. They do not absorb CO<sub>2</sub> at night.

## CAM Plants (Plants in Harsh Environments)



**Evolution!**

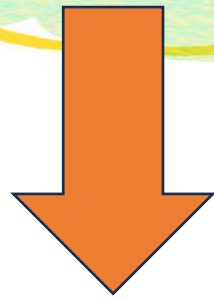


# Research Purpose

13 気候変動に  
具体的な対策を



The more light cacti receive during the day, the more they can prepare to absorb CO<sub>2</sub> at night.



**Find out “the most effective way for cacti to absorb carbon dioxide”!**

**Discover an easy and practical solution to environmental problems!**



# Method: Difference in CO<sub>2</sub> Absorption



Expose to  
sunlight for  
3 hours



Expose to  
sunlight for  
6 hours



CO<sub>2</sub>  
**1000**  
PPM



# Results



Expectation: 6 hours of sunlight would result in higher CO<sub>2</sub> absorption.

|              | 3 hours                                                | 6 hours                                                 |
|--------------|--------------------------------------------------------|---------------------------------------------------------|
| First Trial  | Day : 518 ppm → 522 ppm<br>Night: 1574 ppm — no change | Day : 413 ppm — no change<br>Night: 1425 ppm → 1459 ppm |
| Second Trial | Day : 535 ppm → 590 ppm<br>Night: 413 ppm — no change  | Day : 705 ppm → 715 ppm<br>Night: 413 ppm — no change   |

The experiment did not go well.

- Location after sunlight exposure
- Insufficient duration of sunlight exposure

# Future Plans



Learn from the reflections of this experiment and revise the conditions.



Quantitatively evaluate the relationship between sunlight duration and CO<sub>2</sub> absorption.



Determine the conditions under which cacti can absorb CO<sub>2</sub> most efficiently.



Contribute to CO<sub>2</sub> reduction in Kisarazu City using cacti!

# Reflections on the Research Activity



Kokone Mineo

Cacti absorb CO<sub>2</sub> at night and are easy to grow, making them a simple way to help combat global warming. By analyzing why the experiment didn't go as planned, we can improve future experiments. We will continue caring for the cacti and use them to contribute to environmental solutions.

Through this activity, I actively considered how our actions can help protect the environment. I realized that even familiar plants can contribute to combating global warming, and I felt happy to participate in small but meaningful environmental efforts. I want to continue exploring environmental solutions from different perspectives and not treat these issues as someone else's problem.



Yuzuki Miyazawa



Ami Nakagawa

Through this activity, I was able to deeply consider what individuals can do to address environmental issues. It was a valuable experience to explore ways a high school student like me can contribute. I also realized that reducing CO<sub>2</sub> is not only about cutting emissions but also about increasing absorption, which broadened my perspective.