CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
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Project Number
J1932

Project Title
Oxygen and Carbon Dioxide: Coexistence between Photosynthesis and Respiration

Abstract

Objectives/Goals
I hoped to prove that if a lit candle and a plant are placed in a closed container during daytime, the oxygen and carbon dioxide levels should be maintained in balance; due to the processes of photosynthesis and combustion and this will be evident as the candle will stay lit.

Methods/Materials
This project mainly consists of putting a plant and a lit candle in a closed container, and watching what happens. Then placing the lit candle alone in the container and watching what happens. Then other variables were changed to see in what ways the experiment would be affected. So the experiment was repeated changing some conditions. I did it during the day and night, so I would be able to observe if the plant stopped producing oxygen at night. I did it with plants of different sizes, to see if the size of the plant changed the amount of oxygen produced. Finally, I conducted these tests in and out of my house, to see whether the oxygen level was different.

Results
The lone candle stayed more time lit outside than indoors and more time in the night than in the day. Using a small plant I witness that the candle went out during the day and the night with a very small difference as when it was alone, just 30 seconds. This happened again with the larger plant. Finally when I used a patch of plants growing in my backyard (during daytime) the candle stay lit until the wax ran out, this was 5 hours and 17 minutes. And when I repeated the experiment at night with the patch of plants the candle went out, which confirms that plants do not produce oxygen at night, they stop doing photosynthesis.

Conclusions/Discussion
When a candle is placed in a container with a plant during daytime, it doesn#t go out. Because the plant undergoes photosynthesis at the presence of sunlight and produces oxygen, this doesn#t let the candle finish all the oxygen in the container, needed for its combustion.

Some plants don#t produce enough oxygen to keep a candle alive. To keep the candle alive plants have to produce more oxygen than the one used for combustion by the candle. But the oxygen production is not influenced only by the size of the plant.

At night plants don#t produce oxygen, they don#t undergo photosynthesis because there is no sunlight. As I witness with the experiment at night with my backyard plants.

Summary Statement
Showing the balance between the photosynthesis and combustion, seen from the inputs and outputs of each process (Oxygen and Carbon Dioxide).

Help Received
My mother took the pictures. My mother and sister gave me advice.