

# Do plants grow better in Miracle-Gro Soil?

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## Introduction

We are working on seeing if lima beans and sunflowers would grow faster in regular soil or miracle grow soil. Miracle-Gro soil has fertilizer and the regular soil doesn't.

Miracle-Gro has nitrogen and minerals and regular soil does not have added nitrogen or minerals. Fertilizer helps plants grow, and the package claims that if you use Miracle-Gro plants will grow faster and better than the normal soil.

## Methods

To study plant growth we measured the heights of plants grown with two types of soil. We are measured how big the plants grew. We put a camera in front of them and watched their growth. We planted two types of plants, sunflower and lima bean. We put them in two types of soil, regular soil and Miracle-Gro soil. We measured the plants with a ruler after two weeks of growth. We also measured the plants from the images taken in the time-lapse video after they sprouted.

The time-lapse camera takes a picture every ten minutes. It puts the pictures in a video then plays it back fast. So we can see slow things happen faster

### Acknowledgements

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## Results

We saw that the plants in the Miracle-Gro soil grew faster than the plants in the regular soil. This may be due to the fertilizer. The plants were taller in the Miracle-Gro just after sprouting and after growing for two weeks.

We also noticed the plants moving in our time-lapse videos. We could see the bean leaves moving. This is caused by the pulvinus.

## Pictures

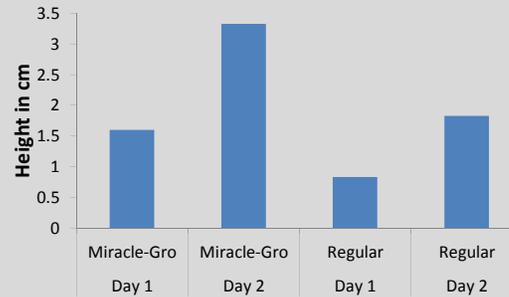


Our plants

Camera

## Graphs of our Results

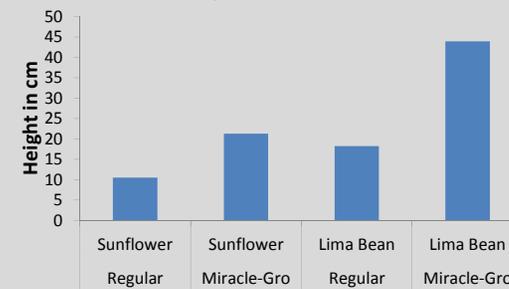
Plant Growth After Two Days of Growing



After the first two days of growth we also saw the Miracle-Gro plants were bigger than the regular soil.

These plants are all sunflowers since the beans did not sprout as soon as the sunflowers.

Plant Height After Two-Weeks

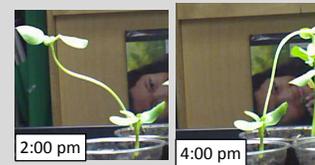


After two weeks the plants in the Miracle-Gro soil were bigger than the plants in the regular soil.

We also saw the lima beans were bigger than the sunflower after two weeks.

## Plant Movement and Videos

### Sunflowers



We saw how the sunflowers dance back and forth during the day when they grow tall. They may be trying to find the most sunlight.

### Lima Beans



The lima beans move their leaves up and down during the day and night. At night and in the morning the leaves are positioned more downward, and then later in the day they move upward. This movement is caused by the pulvinus.

### The Pulvinus

The pulvinus helps the plant track the sun. The pulvinus is responsible for the folding of the leaves. It occurs at night or when the plants are touched or injured. The pulvinus is like a hinge on a door.

During the day the leaf will move upward to track the sun and at night the leaves will move downward. It responds to how bright the light is.

### iPad videos

This is time-lapse videos we made of the plants growing.