



Ooooooh under all
the colors we'll
grow!

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Introduction

- ★ Big Question: What factors affect plants growth?
- ★ Specific Question: How does different color lights affect plant growth?
- ★ Many factors contribute to the growth of plants, our experiment was designed to test the effects of different color light on the growth of our plants.

Hypothesis

- ★ General: Plants will thrive more under white light, than colors, and green will not grow at all.
- ★ Measurable: White light will produce higher stem and more leaves than any other color, and green will not produce anything.

Previous Research

- ★ Park Yujin. et al 2018- States that plants absorb red and blue light the best.
- ★ Khattak et al 2005- Correlates light quality and temperature with plant growth. Presents some confounding data about blue light stating in their tests the amount of blue light correlated negatively with height and internodal length.
- ★ Gerhardt et al 2008- Plants exposed to UVB radiation showed changes in leaf morphology and growth.
- ★ Otto, John Nash 2006- Ultraviolet light has a negative effect on plant grow.

Methods

- ★ Four, 26 watt compact fluorescent bulb
- ★ Four color lenses White (control), Yellow, Red, Green (Independent variable)
- ★ Length, Mass, # of leaves (Dependent variable)
- ★ 4 four quad styrofoam containers
- ★ Miracle Gro Moisture control potting mix
- ★ Brassica rapa plant seeds

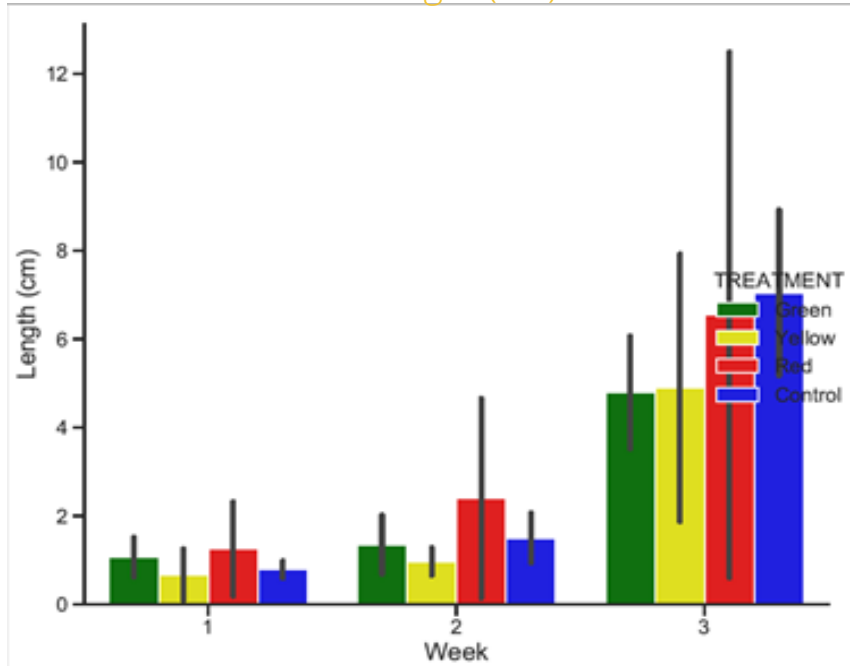
Results

We failed to support our hypothesis on both fronts.

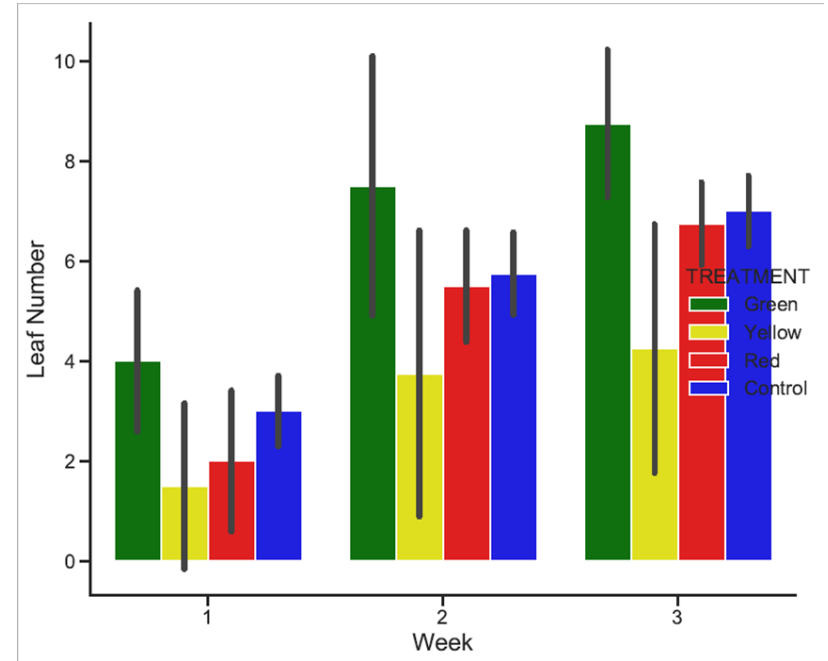
- ★ Green did not fail to grow L (4.8 ± 1.5) M (0.5 ± 0.1) L# (8.8 ± 1.7).
- ★ Unfiltered light did not perform best on all measures.

Qualitative Results

Length (cm)



Leaf Number



Quantitative Results

TREATMENT	WEEK	LEAF_NUM	MASS	LENGTH
Control	1	3.0 ± 0.8	nan ± nan	0.8 ± 0.2
Control	2	5.8 ± 1.0	nan ± nan	1.5 ± 0.6
Control	3	7.0 ± 0.8	0.6 ± 0.2	7.0 ± 2.2
Green	1	4.0 ± 1.6	nan ± nan	1.1 ± 0.5
Green	2	7.5 ± 3.0	nan ± nan	1.4 ± 0.8
Green	3	8.8 ± 1.7	0.5 ± 0.1	4.8 ± 1.5
Red	1	2.0 ± 1.6	nan ± nan	1.2 ± 1.3
Red	2	5.5 ± 1.3	nan ± nan	2.4 ± 2.6
Red	3	6.8 ± 1.0	0.4 ± 0.3	6.6 ± 6.9
Yellow	1	1.5 ± 1.9	nan ± nan	0.7 ± 0.8
Yellow	2	3.8 ± 3.3	nan ± nan	1.0 ± 0.4
Yellow	3	4.2 ± 2.9	0.8 ± 0.7	4.9 ± 3.7
TREATMENT p-values		p < 0.001	p = 0.502	p = 0.658
WEEK p-values		p < 0.001	p = 0.01	p < 0.001

Discussion

- ★ Green light had the greatest number of leaves
 - Light pollution
 - Resource allocation
- ★ Unfiltered didn't perform best
 - Why



Yellow



White



Green

Red



Citations

- Park, Yujin, and Erik S Runkle. "Spectral Effects of Light-Emitting Diodes on Plant Growth, Visual Color Quality, and Photosynthetic Photon Efficacy: White Versus Blue Plus Red Radiation." *Plos One*, vol. 13, no. 8, 2018.
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- Ott, John Nash. "SOME RESPONSES OF PLANTS AND ANIMALS TO VARIATIONS IN WAVELENGTHS OF LIGHT ENERGY." *Annals of the New York Academy of Sciences*, John Wiley & Sons, Ltd (10.1111), 16 Dec. 2006, nyaspubs.onlinelibrary.wiley.com/doi/pdf/10.1111/j.1749-6632.1964.tb48216.x.