

Polarizing Lenses

And their effect on photo quality and visibility

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Introduction

- ❖ Light is visible to humans between 400 and 700nm.
- ❖ Light travels in straight lines called rays and is measured in photons, which Einstein tells us; are packets of energy.
- ❖ Different objects reflect and refract light at different angles, this changes how we see objects.
- ❖ Only transverse waves can become polarized. A transverse wave vibrates on an axis perpendicular to the direction the wave is moving.
- ❖ A polarizer is a medium that decreases light intensity, for example they can be useful to diminish glare in photographs.

Introduction Continued

- ❖ Light can become polarized when it passes through different medias called polarizing filters, because it is a transverse wave.
- ❖ Photographers use different polarizing filters to enhance their photographs.



Hypothesis

- ❖ Different polarizers distort images in different ways.
- ❖ Photo quality and visibility will increase the most with the use of wave retarder lenses.
- ❖ Photo quality and visibility will decrease the most with linear polarizers.

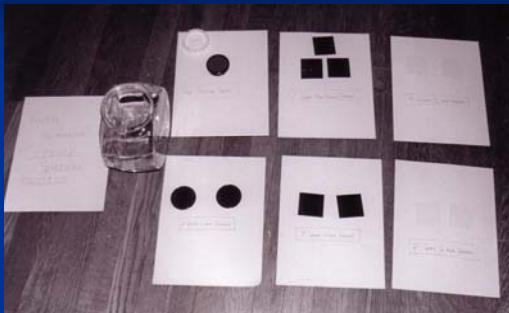
Methods

- ❖ This experimentation was focused around taking photographs of a fighting fish in a fish bowl.
- ❖ Photographs were taken using 6 different types of polarizing filters: wave retarder lenses, linear polarizing lenses, blue blocking polarizing lenses (round and square), a Hoyo polarizing lens.
- ❖ 6 photographs were taken with each filter.

Methods Continued

- ❖ Negatives were processed using Dektol developer.
- ❖ Prints were then made in the darkroom using silver based photography.
- ❖ Photographs were then observed to obtain results pertaining to photo quality and visibility.

Evidence



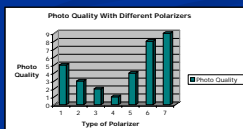
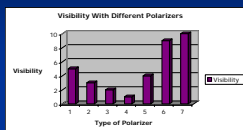
Results



Results Continued

Key: Types of Polarizers:

1. No Polarizer
2. Hoyo Polarizing Lens
3. 2" Blue Blocking Polarizer
4. 1/2 Wave Retarder
5. 1/4 Wave Retarder
6. 2" Square Linear Polarizer
7. 2" Round Linear Polarizer



Conclusions

- ❖ The 1/2 Wave Retarder produced the photo with the highest photo quality and greatest visibility.
- ❖ The linear polarizers showed the least visibility and lowest photo quality.
- ❖ Photographers should work with wave retarder polarizers unless they have a vintage camera that does not use auto focus.

Future Studies

- ❖ Do studies with a wider range of filters that could be acquired with more available money.
- ❖ Look at studies using color photography as well in order to try and compare, also, some polarizers work better with color photography because they make the colors richer and this cannot be seen using black and white photography.