

Exploration: Optics

Issue Teach a lesson on optics to 7th and 8th grade Montessori students.

Solution Use digital cameras to allow the students to explore the principles of lens focal length and how it affects light.
Students had a brief lesson in the principles of light and lenses and were then broken into groups using: the **Trainer Tip: How to Keep Peace When Separating Friends**
Their assignment was to take pictures using multiple variables and then record the variables with the results. The variables were:

- People vs. still life
- Digital SLR vs. “point and shoot” with built-in telephoto-ish feature
- Pentax vs. Nikon

The students were encouraged to go beyond the basics of the assignment and try using the manual settings to further explore light through the F-stop (diaphragm) and shutter speed settings.
Photography is one of my hobbies, so I was able to supply the cameras and SD cards for the lesson, which resulted in no cost to the school.
Because the lesson had both group and independent segments, was hands-on, and very visual, it reached the “learning styles” of all the students.

Results Naturally, the students enjoyed taking pictures of each other and learned a lot in the process. One student, who I later had in Special Education, really got a lot out of the exercise, which was unusual for her. It was nice to see her get involved and potentially gain a new hobby. The following pages show the worksheets used for the lesson.

Classifications The table below lists two classifications and the recipients of this work sample.

Performance Experience Design ¹	Characteristics ²	Recipients
Innovative	Creative	7 th and 8 th grade Montessori Students
Respectful	Resourceful	
Empathy		
Meaningful		
Empathetic		

¹ [Click here](#) to view list and descriptions of Performance Experience Design characteristics

² Reason(s) it was provided as a work sample

Morning Work March 28, 2017

Match the body parts to the camera parts. Put the letter of the camera part from the list below next to its corresponding body part.

- | | | |
|--|-------|---------------------|
| A. Lens | _____ | Cornea |
| B. Film developer/transfer to computer | _____ | Optic nerve & brain |
| C. Shutter | _____ | Eyelid |
| D. Diaphragm | _____ | Pupil |
| E. Printed photo or on screen | _____ | Image is seen |
| F. Shutter release | _____ | Blink |
| G. Film/ SD card | _____ | Retina |

Photo Tracking Sheet

Name: _____

Subject of photo	Camera brand	Camera Type	Lens size	SD Card #	Observations
A.	<input type="checkbox"/> Nikon <input type="checkbox"/> Pentax	<input type="checkbox"/> SLR <input type="checkbox"/> PAS	<input type="checkbox"/> Standard <input type="checkbox"/> Telephoto		
B.	<input type="checkbox"/> Nikon <input type="checkbox"/> Pentax	<input type="checkbox"/> SLR <input type="checkbox"/> PAS	<input type="checkbox"/> Standard <input type="checkbox"/> Telephoto		
C.	<input type="checkbox"/> Nikon <input type="checkbox"/> Pentax	<input type="checkbox"/> SLR <input type="checkbox"/> PAS	<input type="checkbox"/> Standard <input type="checkbox"/> Telephoto		
D.	<input type="checkbox"/> Nikon <input type="checkbox"/> Pentax	<input type="checkbox"/> SLR <input type="checkbox"/> PAS	<input type="checkbox"/> Standard <input type="checkbox"/> Telephoto		
E.	<input type="checkbox"/> Nikon <input type="checkbox"/> Pentax	<input type="checkbox"/> SLR <input type="checkbox"/> PAS	<input type="checkbox"/> Standard <input type="checkbox"/> Telephoto		

Subject of photo	Take photos of the still life setups as well as the classmates in your group.
Camera brand	
Camera Type	SLR = Single Lens Reflex, PAS = Point and shoot
Lens size	Use both standard and telephoto lenses. Make sure to see (AND RECORD) what the differences are when you compare the pictures.
SD Card #	There should be an identifying number on the SD card
Observations	Become a photo detective. What differences can you spot? Which camera was easiest to use?

Who was in your group? _____