Physics: Optics and Light! **Instructor: Barton Clark**

CREDO High School ***for your notes*** **Fall 2026**

Lenses, Light and Black holes! *Poster Project.*

Your poster should include the following items.

Playful drawings that show you engaging with the five, experimental lab activities

- Experiments 1 & 2 can share a drawing, of you casting a projected image onto a screen opposite the candle that was giving off light.
- Experiment 3: in which you used your lens as a magnifying glass (creating a 'virtual image')
- Experiment 4: in which we took our lenses outside and measured directly, the focal length of the lens (as you burned your way through piles of leaves and papers).
- Experiment 5: Index of refraction and Snell's law with the semi-circular Lucite lens.

Technical drawings (called Ray Diagrams) that represent each of those same experiments, noting measured values for image distance, object distance, drawing 'Normals' (for the Index of refraction lab) which we used to measure angles from). These would be like the drawings Clark did on the board. Note: for the Index of refraction sketch, you don't need to include all of your measurements, just a handful to illustrate the effect of refraction and how we measured the angles).

Mathematics: Each of those drawing above should include any relevant measurements (including Uncertainty) and mathematics. (i.e., determining the Focal Length from calculation and Index of refraction using Snell's Law to determine the Index of refraction. And within this section, a visual representation of the final, calculated values for f including the respective Uncertainties in those final calculations. *(think sideways Bar Chart)*.

A section describing/illustrating how our eyes perceive color *(refer to the website: Structure and function of the eye).*

A section showing how we photographed Black Holes! *How can this be possible? How do radio telescopes work? How can scientists use these telescopes to see so far out? How can we increase the precision of what we see? How do Black Holes actually give off light? What the heck ARE we seeing, after all?*

Grading rubric

Did you complete the assignment? All of the required steps? Did you go beyond?	5	4	3	2	1
How well did you communicate your ideas? Using words, pictures, diagrams?	5	4	3	2	1
Was your data/analysis accurate? Is the calculations/descriptions correct?	5	4	3	2	1
Were you creative in your writing? Drawings? Organization?	5	4	3	2	1
Does your final product/report/poster look clean, organized and professional?	5	4	3	2	1

Your score _____/ 23 possible