

Optics Research Assignment

Name: _____ Topic _____

You can choose a technology option or a biological option (eye disorders).

Technology

Analyze or build a technological device or procedure that was designed to make use of light and its properties. Explain how it works and how it has benefitted society. You will present your findings to the class in a short 5 minute presentation. Try to evaluate the positive and negative impacts of this optical technology and make a final decision about its usefulness. You are required to have 1 visual aid to help explain your topic to the class.

- Suggested presentation outline:**
1. Introduce your optical device/procedure
 2. How does it work? What properties of light is it based on?
 - 3 Societal impacts: both positive and negative.

Suggested topics (not limited to)

Technological devices related to SOURCES OF LIGHT:

Lasers, LED's, glow sticks, fluorescent lights, phosphorescent lights

Technological devices related to PROPERTIES OF LIGHT:

Microscopes, solar ovens, camera, retroreflectors, fibre optics, laser surgery (in general), binoculars, Security mirrors (convenience stores)

Technological device/procedure related to HUMAN PERCEPTION OF LIGHT:

Eye glasses, contact lenses, low light vision sensors, laser eye surgery, coloured filters for dyslexia, Polaroid sun glasses.

Criteria	Level 1	Level 2	Level 3	Level 4
K& U How does your device work <u>with regards to properties of light.</u> Understands in own words	- Provides limited amount of accurate and relevant information.	- Provides some accurate and relevant information. Some omissions/errors.	- Provides sufficient amount of accurate and relevant information. Perhaps uses some vocabulary that is too sophisticated for class.	- Provides sufficient amount of accurate and relevant information. Uses vocabulary that is appropriate for class.
Application Research – evaluate the effectiveness (pros/cons or advantages/limitations)Or..... Build – reflect and assess building challenges that occurred.	- attempt at analysis. Perhaps only 1 side considered or weak analysis for both sides. - attempted to talk about building challenges but unclear about what was difficult or what the solution was.	- Some analysis of device. One side is weak. Makes a final decision on usefulness. - Identifies building challenges. Perhaps just 1 challenge mentioned or perhaps solution not offered or explained well.	- Good analysis of device. Has considered both sides. Makes a final decision on usefulness. - Can identify 2 building challenges faced and describe how they were solved.	- insightful analysis of device. Strong evaluation of both sides. Makes a final decision on usefulness. - Can identify 3+ building challenges faced and describe how they were solved.
Communication Communicates with sense of audience (audible voice / good eye contact) Uses required visual aid to enhance presentation	- communicates with a limited sense of audience. - limited use of visual to explain topic...but has one!	- communicates with some sense of audience. - some effective use of visual to explain topic. Perhaps forgets to use now and then.	- communicates with a clear sense of audience. - effective use of visual to help explain topic.	- communicates confidently with a sense of audience. - Highly effective use of well-chosen visual that helps viewers make connections.
Communication Documents research findings properly (source listed on top, date found, point form notes) Cites sources used in proper APA format	- Struggling to met research criteria. Attempted. - attempted to cite 1 or 2 sources but errors. YOU MUST HAND IN	- Some research criteria met. - 2 sources cited properly YOUR RESEARCH	- most research criteria met - 3+ sources cited properly NOTES!!	- all research note criteria met. - 3+ sources cited properly. At least one is a <u>text</u> source.

Optics Research Assignment

Name: _____ Topic _____

You can choose a technology option or a biological option (eye disorders).

Eye Disorders

Research an eye disorder.. Explain how it is caused and how it affects one's vision. You will present your findings to the class in a short 5 minute presentation. Try to explain 2 different methods of treatments doctors might suggest and decide which treatment you would choose You are required to have 1 visual aid to help explain your topic to the class.

- Suggested presentation outline:**
1. Cause of your eye disorder and early symptoms.
 2. What are the long term effects and how is this affecting vision?
Use ideas here we have learned about light transmission (ie: is light getting through?) and lens (remember the eye has its own lens).
Link to optics here!
 - 3 Two treatments doctors would suggest and offer your opinion on the best option.

Suggested topics (not limited to)

Cataracts, astigmatism, retinal detachment, glaucoma, macular degeneration, colour blindness

Criteria	Level 1	Level 2	Level 3	Level 4
K& U How does this disorder affect vision? <u>Make reference to light transmission and lens.</u> Understands in own words	- Provides limited amount of accurate and relevant information.	- Provides some accurate and relevant information. Some omissions/errors.	- Provides sufficient amount of accurate and relevant information. Perhaps uses some vocabulary that is too sophisticated for class.	- Provides sufficient amount of accurate and relevant information. Uses vocabulary that is appropriate for class.
Application Decides on course of action based on risk analysis. ie: consider benefits of each treatment and risks of each treatment.	- attempt analysis. Perhaps only 1 side considered or weak analysis for both sides.	- Some analysis of 2 choices. One side is weak. Makes a final decision that is briefly explained.	- Good analysis of 2 choices. Has considered both sides. Makes a final decision that is briefly explained.	- insightful analysis of 2 choices. Strong evaluation of both sides. Makes a final decision that is very logical and well explained.
Communication Communicates with sense of audience (audible voice / good eye contact) Uses required visual aid to enhance presentation	- communicates with a limited sense of audience. - limited use of visual to explain topic...but has one!	- communicates with some sense of audience. - some effective use of visual to explain topic. Perhaps forgets to use now and then.	- communicates with a clear sense of audience. - effective use of visual to help explain topic.	- communicates confidently with a sense of audience. - Highly effective use of well-chosen visual that helps viewers make connections.
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Research Notes **You must hand in for Communication marks**

Source: _____ Date found: _____

Point form notes:

Research Notes

Source: _____ Date found: _____

Point form notes:

Research Notes

Source: _____ Date found: _____

Point form notes:

How to cite sources: **Include a 'Bibliography' on a separate sheet. Hand in with presentation.

Web pages on Internet

Author's last name, initial. (if no author, do not include) Date of original posting/revision (if not available write 'n.d.'). Name of page. Retrieved month, day, year, from (list internet address).

****if your URL is really long, just include the home page address**

Encyclopedias, newspapers and magazines

Author's last name, initial. (Date of print publication: year, month, day). Title of Encyclopedia/newspaper/magazine, Volume number, page numbers. If online – retrieval date (month/date/year)