Light Pollution Awareness Amongst Middle School Students

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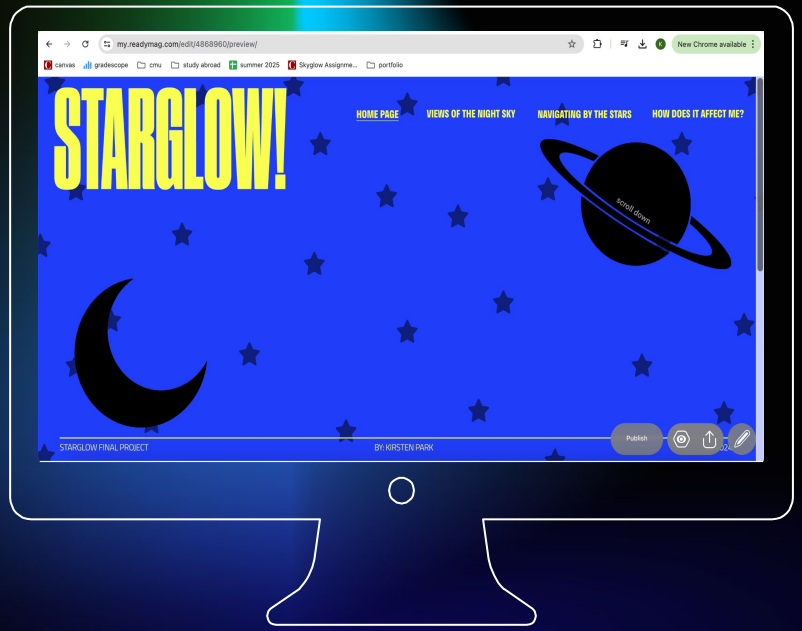
Final Project

Interactive website to support middle school teachers spread awareness of light pollution

Link: https://readymag.website/u935724207/starglow/

Introduction to My Final Project



I have created a website called "Starglow" on a software called ReadyMag.

- PURPOSE: offer an additional resource middle school teachers can use to help educate their students on light pollution
- AUDIENCE: middle school students

There are a total of 4 pages and each page has interactive features that will allow students to stay engaged with the learning material.

My Process

1. Research

- Is interactive online learning an effective method of teaching?
- What is light pollution and what are its effects on humans, animals, and star visibility? (3 topics covered on my website and report)
- How do you write a research report?
- How do I build a website?

2. Drafts

- What software will make it easier for me to create the designs I drew? Which ones are free?
- What design ideas are feasible?
- What interactive features will be engaging enough for students, but not distracting to the material?

3. Report/Present

- How to write a report in a story telling tone?
- How can I write keeping my audience in mind? (teacher group)
- How can I analyze my research in order to support my thesis?

UI UX Methodology

Empathize: What is the problem? Who are my users/audience? 

Define: What do my users/audience need? How does the problem affect them? 

Ideate: What are feasible solutions (products) to the problem? 

Prototype: What does the product look like? How does it function? 

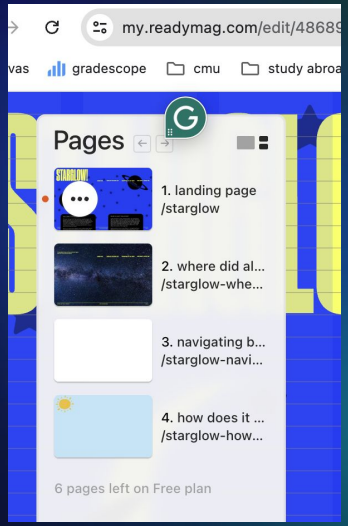
Test: Does the product solve the problem? Are users/audience satisfied with the solution? 

My Progress

Website

½ way done!

Wireframe sketches!

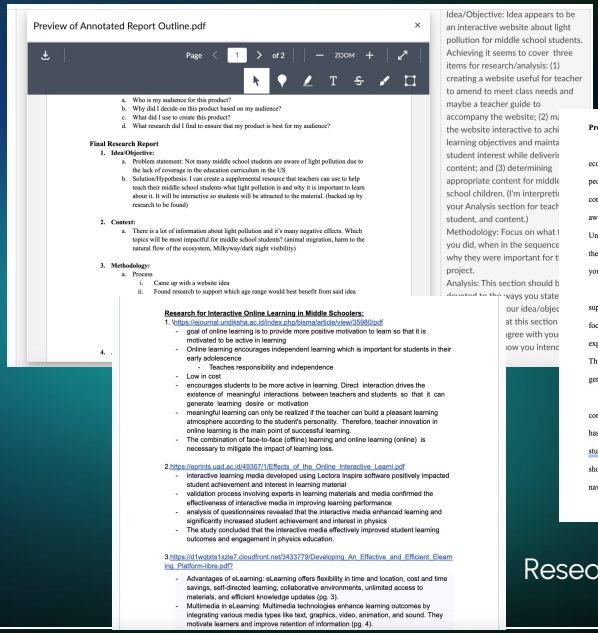


Initial designs - 2/4 pages done!

Report

First draft done, starting to edit and revise.

Annotated report outline



Research + drafts

02

Research + Outcomes

Website + Light Pollution Research

Interactive Learning Research

Advantages of elearning:

- Learning outcomes enhanced by:
  - Text
  - Graphics
  - Video
  - Animation
  - Sound

They motivate learners and improve retention of information (pg. 4)

Disadvantages of elearning:

- Only text-based content
- Lack of rich instructional materials
- Insufficient interactivity
- Unstructured multimedia instructions
  - These limitations hinder the effectiveness/ engagement of learners (pg. 3).

Common issues all fixed by adding an interactive element to these resources!

Anaraki, F. (2004). (rep.). *Developing an Effective and Efficient eLearning Platform* (pp. 1–7). University of Thailand.

Light Pollution Research

3 MAIN TOPICS:

1) Why does artificial light hide the stars in the night sky?
2) How do seals use the stars to navigate and migrate?
3) How is the human circadian rhythm affected by artificial light?

Visibility of the Night Sky

Skyglow: brightening of the night sky over populated areas due to the scattering of artificial light by particles in the atmosphere. This scattered light increases the overall brightness of the sky, reducing the contrast between the sky and the stars, making faint stars invisible.

Glare: Bright lights in urban areas create glare, which can make it difficult for our eyes to adjust to the darkness. When exposed to intense light, our eyes become less sensitive to faint light from stars, making them harder to see.

Elephant Seal Migration

In a study conducted by the University of Southern Denmark, researchers placed seals in a planetarium to simulate a night sky with 6,000 stars. They trained the seals to swim toward specific stars, demonstrating that these animals can recognize and orient themselves using stellar patterns.

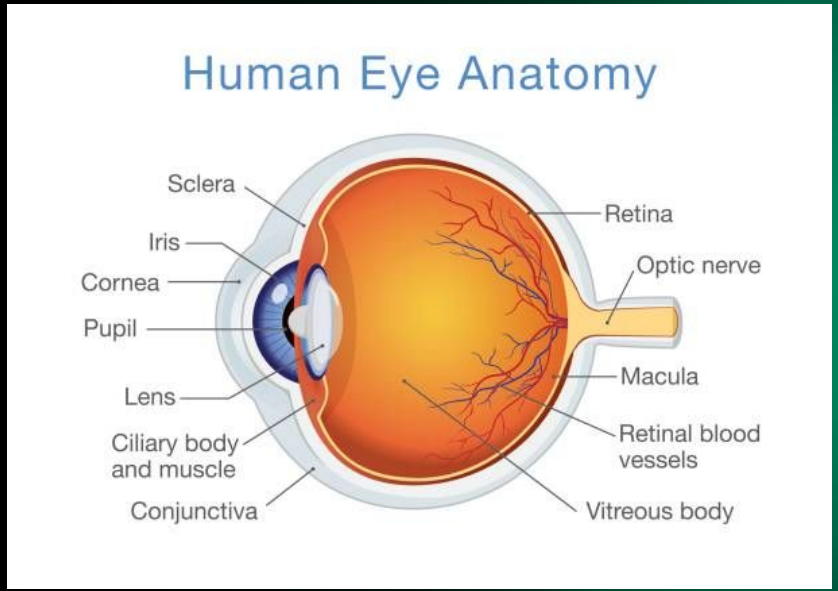
O'Neill, I. (2008, June 17). Seals use astronomy as navigation aid. Universe Today. https://www.universetoday.com/15117/seals-use-astronomy-as-navigation-aid/

Human Impact

Our Eyes

- Rods/cones = light-sensitive cells in the retina. (dominate night vision, making things appear colorless improving visibility)
- Retina = an extension of the forebrain (has about six million cones concentrated in the fovea for color vision in daylight and 120 million more sensitive rods for low-light vision)

Artificial light makes it difficult for the rods in our eyes to adjust to night time vision making it harder for our eyes to see the faint star light in the sky.



Human Impact

Circadian Rhythm

A third type of photoreceptor in the mammalian eye helps regulate circadian and other non-visual responses to light enable synchronization of the circadian pacemaker with the light-dark cycle, ensuring that physiological processes follow a regular daily pattern even without visual input.

Artificial Light...

- Suppresses melatonin production
- Over stimulate ganglion cells
- Disrupt circadian rhythm

Mizon, B. (9999). *Light Pollution Responses and Remedies* (2nd ed.). Springer.

03

What I Learned

My experience and awareness of light pollution

My Experience

How was the class?

Appreciated the amount of resources given to us through lectures. Helped me a lot when making my project.

Collaborative nature of the class allowed me to find everything I needed to succeed, whether it was from peers or the professor!

Developed better research skills through this course

Importance of Light Pollution To Me

Awareness

Lack of awareness in the community became very apparent.

Action

There are simple daily habits I can fix to play my part in limiting light pollution.

Dangers

- Realized staring at my phone/other lights at night has been disrupting my circadian rhythm.
- Lack of sleep can cause many chronic illnesses.
- Just as harmful to ecosystem than other pollutants.

Thank You!

Do you have any questions?
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Finished website will be shared soon!