

Skyglow- Waldo's Great Adventure

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Main Goals of the Project

- Introduce children (5-6 years old) to some of the broader issues of light pollution – specifically, that bird migration is negatively impacted by ALAN
- Demonstrate practical solutions that can be taken to mitigate the effects of ALAN
- Encourage community involvement
- Foster empathy with wildlife
- Inspire future generations to learn about and advocate for the solutions to light pollution
- Instill a sense of responsibility to protect the environment



Our Final Product Canva Storybook

- Storybook highlighting the effects of heavy ALAN on bird migration to the south
- Via our protagonist, Waldo the Warbler, children will establish an empathetic relationship providing more stakes to the issue at hand



WALDO'S GREAT ADVENTURE



Hi! my name is Waldo. My family
and I are warblers – we've got
bright yellow feathers and we
love to sing songs.





**We live
up north, and the days are
getting shorter and colder.
Some of the leaves are
starting to change color. My
mother says we will start our
migration tonight. We will fly
south to warmer climates
where more food is available.**

**I am nervous about flying south, I
have never flown that far before.
What if I get lost and can't find
my way home!?**





My mother tells me to stick with
the family and that if I follow the
moon and stars, I won't get lost. I
look up and see the bright moon,
surrounded by even brighter,
twinkling lights in the sky.

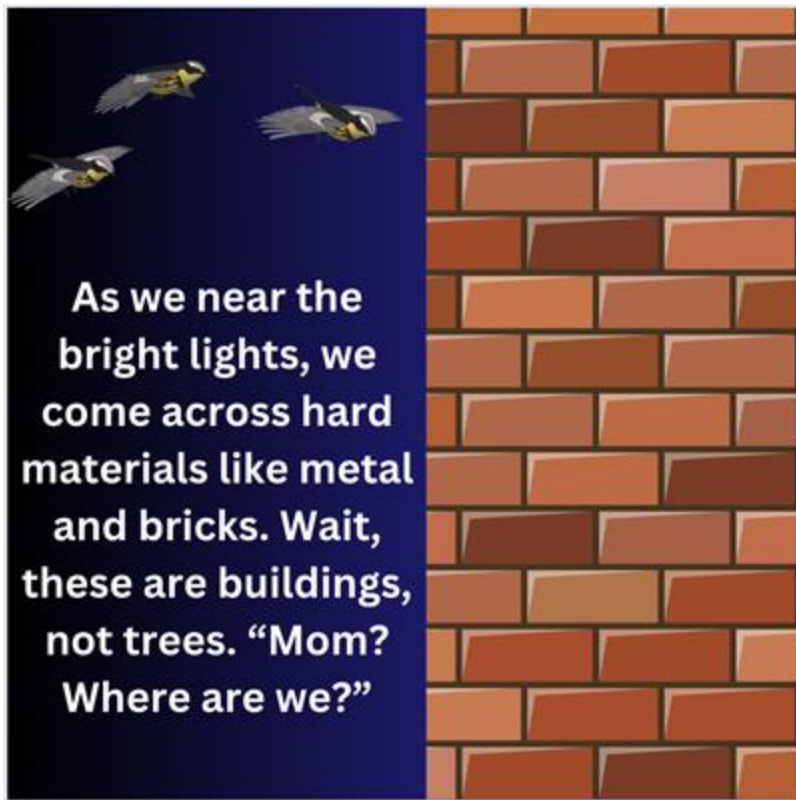


**We begin our
journey**

“Wow, look at all those lights in the distance. They are so bright. Let’s follow those ones.” My mom leads our family toward the bright line of lights in the distance.



As we near the bright lights, we come across hard materials like metal and bricks. Wait, these are buildings, not trees. “Mom? Where are we?”



“I don’t know, honey. I can’t see anything with all this skyglow from the bright city lights!” I look up at the sky and see all black. The city lights have made the stars disappear.



We keep flying around for what seems like hours upon hours. The bright lights disorient our sense of direction. We have gotten nowhere and are getting tired. We need to land somewhere soon.



Smack! My Uncle flies into a window. "Oh no, are you ok Uncle?"



We landed close by to where my uncle had fallen. He is alright, but he needs to rest for a couple of hours. We settle in a grassy patch in a nearby backyard that seemed safe.



There are so many bright lights in the backyard that I can't fall asleep or relax. My body is tired, yet I don't feel tired enough to go to bed. My mother is awake too.



I see a young girl sitting on a backyard swing set on her back porch. She sees us and comes running off her back porch and into the backyard straight toward us. We all scatter around running away from her.



"No, please! Don't run away from me, I want to help you!" She kneels down beside me. "My name is Lola. I entered Kindergarten this year. We have been learning about all different kinds of animals. Birds are my favorite, I see them every day on the playground!"



Oh, maybe she did want to help my family after all. She asked, "What's wrong? Why are you birds still here? It's too cold for you here, it's almost winter."



“My name is Waldo. My family has been trying to fly south to warmer regions but we can’t see the stars anymore and we don’t know where to go. Also, my uncle flew into a window and injured his wing, and we can’t leave him.”

Hi!



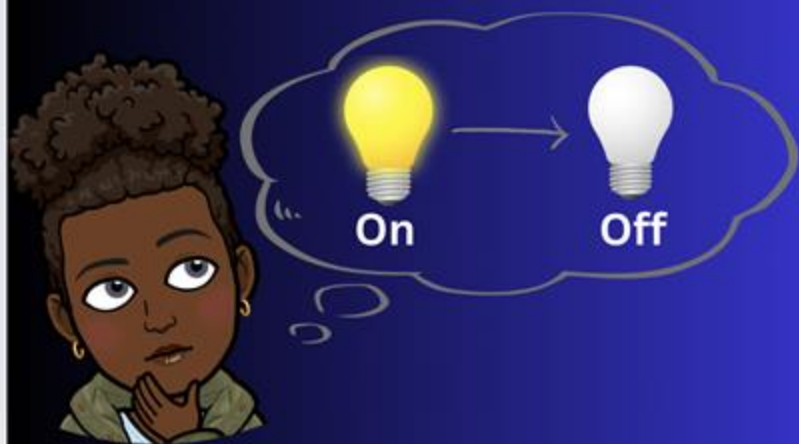
“Oh no! That’s awful! I’m going to try to help you. Wait here, I’ll get my mom and see what she has to say.”



She quickly ran into the house to get her mom. Lola led her mom toward me. "Mom, we have to help the birds, they can't see the stars to fly south! They are lost because of all the bright lights in town. They are so tired and they just want to fly to warmer regions!"



The mom said that was a great idea. Lola responded, "We can explain to the neighbors and ask them to turn off all their lights for the night. Then, Waldo and his family can get back on track."



Lola and her mom carry me from door to door explaining my situation to the neighbors. All the neighbors slowly go around their home flipping off their front door, shutting off their garden lights, and closing their blinds.



We had circled the whole neighborhood, asking all the families in the community to shut off their lights. By the time we got back around to Lola's house, I could see the whole sky! Lola took me back to my family.



“Oh Waldo, I really hope that helps your family. Is there anything else I can do for you?” Lola asked.



I replied, “No, Lola. You and your mom have helped us so much! We can’t thank you enough.” I saw many of my family members nod their heads behind me.



I watch as my mother takes flight again. My uncle felt rested enough and he followed her. Slowly, all the members of my family began flying away. It was my turn.

Lola petted my head and asked, "Will you come visit me next year, Waldo?" I said yes.



My family and I finally made it to our destination in the south. We were able to see the stars during the rest of our migration. We didn't get lost again.

It was so warm here, and it felt good against my feathers. I couldn't wait to visit Lola again next year.



The next year...

**I used the stars to navigate to
Lola's town on our journey south. All
of the outdoor lights around the
town were different now.**



I landed on Lola's front porch and pecked at the doorbell. It rang and Lola came running out.



"Hello Waldo! I am so excited you're back!" Lola jumped up and down. She walked me around to her backyard and talked about how exciting school was for her that year.



“My mom and I felt so bad that your family was lost because of our lights. We didn’t want them to confuse any other birds. We went to the town mayor and petitioned him to change the town’s lighting system.

Now they’re motion sensor activated, they only turn on if humans are moving in front of them. That way, no bird will ever get lost here on their migration since they will always be able to see the stars!”

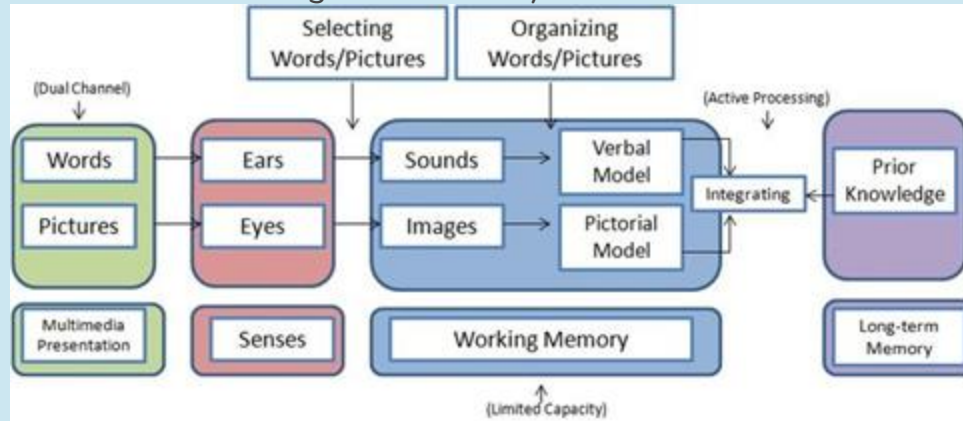


**“Aw, thanks Lola. You’re the best!”
We looked up at the stars together.**



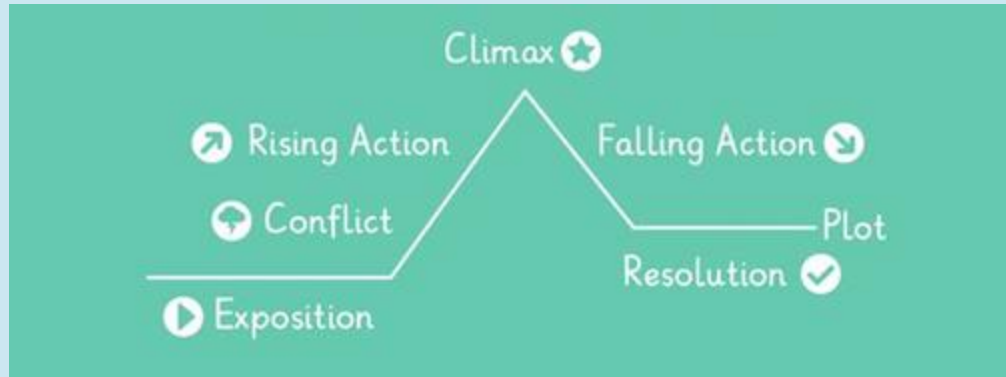
Why a storybook? (Critical Analysis)

- The storybook is a combination of pictures and brief sentences.
 - Story book elements can enhance learning when connected with a child's learning style.
 - Learning styles may include visual, verbal, aural, logical, physical, social, and solitary (or combinations of those)
 - The visual and verbal aspects of a storybook as well as having it read out loud (aural) can appeal to a broad range of learning styles
 - Mayer's Cognitive Theory of multimedia- visual and verbal memories interact
 - Based off of the Information Processing Model (brain processes information in steps like a computer)
 - Stimuli is perceived by senses->given meaning->integrated with prior knowledge->moved to long term memory



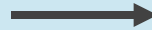
Why a narrative? (Critical Analysis)

- A narrative is a series of events that is structured into a story, typically following a protagonist.
 - Following a chronological story and a main character acts as an intrinsic motivator that encourages readers to be invested in what happens next in the story
 - Using story elements can have positive effects on learner memory, motivation, and engagement
 - Using narratives and storytelling can generate interest in the subject matter



Why did we talk about this aspect of light pollution?

- Focused on animals – children are more likely to develop empathetic/sympathetic relationships → longer lasting
- Serves as introduction to the effects ALAN has on wildlife/ecosystems
- The story underscores the urgency and importance of addressing light pollution to protect wildlife and maintain ecological balance
- We thought that this was one of the more interesting effects of light pollution from class and wanted to highlight it



Staff (2019), Light Pollution Poses Threat to Migrating Birds. *Dark Sky International*. <https://darksky.org/news/light-pollution-poses-threat-to-migrating-birds/>

Ziegler, A. K., Watson, H., Hegemann, A., Meitem, R., Canoine, V., Nilsson, J. Å., & Isaksson, C. (2021). Exposure to artificial light at night alters innate immune response in wild great tit nestlings. *The Journal of experimental biology*, 224(10), jeb239350. <https://doi.org/10.1242/jeb.239350>

How does it address light pollution?

- The storybook illustrates the direct effects of ALAN through the experiences of Waldo and his family
 - Bright lights disrupt their navigation → they can't follow their natural migration cues
- Showcases that proactive action by communities can lead to improvements
 - Short term: turning lights off at night, such as Lola and her neighborhood does, provides a temporary solution
 - Long term: Petitioning town electees to make improvements such as the implementation of motion sensor lights → systematic change that can improve the experiences of birds in the future



Lessons and Insights Learned

- Light pollution affects all different kinds of animals in various ways. As we researched which animal to focus on, we learned about all the effects on other animals as well, especially turtles.
- Language can impact and change the tone of the story, gearing it toward a younger audience. This helps children learn core concepts in ways that are simpler and broken down so they can understand on their level.
- Despite story books being made for children, they take a lot of reworking to make sure that ideas are connecting both for adults like us who read it but also children thinking about it. We have to look through the lens of a child.





Sources

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