

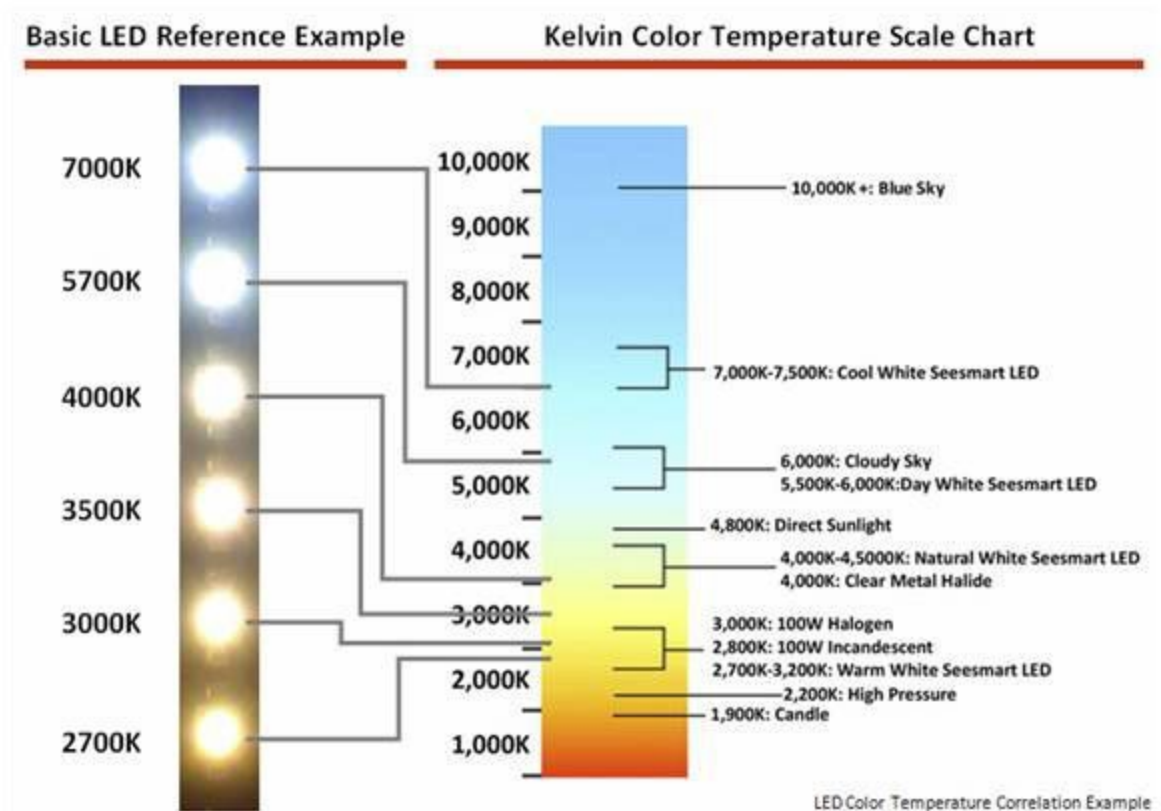
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Illuminate Final Report

Light pollution is caused by excessive artificial lighting. It is an incredibly common form of pollution especially in cities and towns. It's most noticeable result is the inability to see the stars. This causes problems for astronomers studying objects in space, even with powerful telescopes. However this excessive lighting can affect more than just the nighttime view. The inability to see the night sky can also be disastrous for migratory birds that use stars to figure out direction. They can get stuck flying in circles around especially powerful lights all night leading to exhaustion. It also affects other wildlife such as baby sea turtles who, when they first climb out of their egg, head in the direction of the stars on the open ocean and can get turned around by the bright lights of seaside houses.

Not only does light pollution affect animals, it has negative effects on humans as well. It affects our sleep patterns by having bright street lights shining into bedrooms, it causes accidents while driving due to glare and even makes it more dangerous to walk around at night. Although it may seem counterintuitive that an increase of light would make it more dangerous to walk around at night, bright lights cause a person's pupil to contract and makes it harder to see shadows. On top of that it is a waste of energy and money.

The International Dark Sky Association seeks to reduce light pollution and establish dark sky communities. There are many benefits of being a dark sky community. Wildlife is able to better navigate and people are better able to see the stars which in turn attracts more tourists which leads to more profit for dark sky communities. One way that we can prevent light pollution is by changing the color of the lightbulbs that we use. Light exists on a spectrum of yellow and blue light. Blue light uses more energy and is much brighter than yellow light. Switching from blue to yellow LED could significantly improve the effects of light pollution.



Some other ways of reducing light pollution include putting covers over lights so that the light that they produce is focused on the ground and getting rid of redundant lighting, only having what light is necessary.

I was a part of the outreach team and a part of group Deneb. Our group decided to start small and focus on Truman hoping that if Truman changed it's lighting then it could provide an example for the rest of the Kirksville community to follow. Our three main goals were to: one, determine which sources of artificial light around the Truman campus posed a problem for becoming a Dark Sky Community. Two, to look into the cost of several different artificial lights that could be used here on campus, this would help us to create a cost effective plan to change campus lights. For our third goal, we wanted to reach out to the sustainability office at Truman in order to inform them of the effects of light pollution and show them our plans for reducing the campus' light pollution. Out of our goals that we accomplished one was our campus light survey.



This picture shows an example of poor lighting on campus as the light is pointing in every direction.

We didn't email the sustainability office but we did email ResLife. We also talked to Sam Guth, the director of Physical plant.

After our discussion with Mr. Guth, it seems that the main thing preventing Truman and Kirksville from a dark sky is that they can only replace lights once they go out. I would recommend future teams to show the cost benefits of having night friendly lighting and in the meantime advocate for more immediate solutions that could be implemented such as light covers.

Overall I found this class to be interesting. I knew what light pollution was before taking this class but I enjoyed learning more about light pollution and what we can do to solve it. However it is clear that COVID-19 did not provide an ideal situation in which to introduce a new class and while I think several of the class's shortcomings can be attributed to this circumstance there are a few suggestions that I have which I think will improve the class for future students. My first suggestion is to have the class meet more than one day per week. There were a lot of different parts to this class including the shared experiences. It was very jarring for me to go

from talking about light pollution one week to a shared experience another to going back to talking about light pollution and trying to remember where we had left off two weeks before. Meeting more than one day a week would allow for the shared experience but we could also talk about light pollution in the same week so there would be less of a disconnect. My second suggestion is to somehow create more cohesion between the teams. There were many times throughout the semester that I felt as though my group, the outreach team, was in a sort of bubble most of the time I was completely unaware of what the other teams were doing. I think that this could possibly be achieved through more meetings as an entire class, which would be made possible by meeting more than once a week. One day all teams could meet as a class and on others met as a single team. Another possible way of achieving further unity is through more collaborations between teams through small joint meetings between two or three teams.