

Light pollution assignment



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AP English Literature 11 April 2012 Introduction Light Pollution Imagine.

You've just reached home after a long day at work. You take off your shoes, place them neatly against the wall, change into lounge and sink into the couch. Your eyes are weary so you dim the lights and turn on the television. Time passes by and you remain unmoved. Your skin seems attached to the fabric of the couch, the TV is low, creating a soft rumble to sleep to, accompanied by a faint glow in the darkening room.

You're fading in and out, your eyelids are beginning to fall to the modesty of the screen, and then as you're about to fall asleep GUESS WHAT YELLOW!! A commercial comes on flashing bright yellow! Your eyelids clasp tightly together, straining to hide from the light. You're awake again, uncomfortable, and in pain. That's light pollution. Or maybe you remember that one conversation where your friend bombarded you with talk of nature and how it's better than the city? They went on and on about the hustle and bustle of city life and its inferiority to the nice quiet life of the forest and country.

Before writing them off as weird, think about it. Was what they were saying really strange? Remember visiting that place devoid of skyscrapers and lights, and what they said: "smell the fresh air, feel that breeze, listen. Look at the stars. You don't see that in the city, do you?" Whether or not they're weird is up to you, but they were definitely on to something. Do you really see all those stars in the city? No. Why? Light pollution. Have you ever been on vacation to a nice sunny place, with beautiful weather?

You're down south, walking down the beach boardwalk, enjoying yourself when you stumble upon a sea turtle belly up at your feet. It can't be any older than a few days, yet it lies there unmoving. Its skin scorched by the sun and scathed by the sand. The turtle, newborn and unaware, headed out for the ocean following that bright light meant to guide it there. But instead of following the moonlight, it followed the much brighter city; he became stranded and left victim to the heat. That is light pollution.

Light pollution is both a much unnoticed and very large problem in the society today. Part of the problem in fact, is its lack of media coverage. Light pollution affects both wildlife and human life in many ways. It is creating an environment unfit for many species of animals. Various nocturnal species are finding themselves surrounded by newly built lights and sea creatures along the US coastal area are all becoming victims to this underrated abuse. They are becoming endangered and having to migrate into an unknown, potentially dangerous environment.

The abuse of lighting for our own recreational purposes is harming those it isn't even intended to affect. Which raise the question: how does it affect us? Like animals, it makes our environment very stressful and distracting at times; it's causing us to change our habits and turning us into creatures afraid of the dark. It is also a drain on our revenue(??), wasting a lot of energy and money – which in society today, are two very important things. In addition light pollution is a controversy we don't even need in today's life – extra brightness – but also one of the easiest to fix.

There are many quick, simple, and highly beneficial fixes to this problem, with nearly no negative repercussions. Despite this, no action is taken and it continues to exist. Right now we are at the point where we can stop it before its too late, and instead of taking action, we simply continue on, allowing light pollution to grow, consume, and develop into an even bigger problem. What is Light Pollution? It is exactly as it sounds: Pollution. It is the act of process of contamination through the discharge of a harmful substance (American Heritage Dictionary).

In this case, that harmful substance is light. From first discovering a new source of light, man has made the best of it dating back to the discovery of fire, then to the use of candles, the lamp, and most recently electrically-created light. – What’s different now though? What makes it harmful? – With the advancing of technology and ever- hanging state of the world – industrially, commercially, economically, morally – lighting is being taken advantage of and used to the most of its capacity; this however, is not a good thing.

The capacity cap is far more than we need, by business standards it would be going bankrupt: The majority of light produced is wasted more than used. This extreme use of light in abundance is the definition of light pollution, and is present in many different forms. Glare Glare is one of the three main types of light pollution. It is caused by unnecessary and uncontrolled brightness (RIP). This happens when a source of light with higher luminance than what your eyes are fixed on suddenly appears in your line of sight [see Figure x].

The visual sensation is broken down further into two categories: discomfort glare and disability glare. Discomfort glare occurs when brightness induces pain or annoyance. This occurs often within television, film, on the road (street lights, headlights), and in dim shadowed areas and rooms. The sudden introduction of a large amount of light causes the viewer to wince and take a moment to adjust to the new light level. Discomfort glare has harmful capabilities but they are nothing too dangerous, disability glare is where the most danger lies. Large is also caused by an overexposure to luminance, however, it is so extreme that the response is temporary blindness whether by the brightness itself or the need to avert our eyes. It is common along roads, freeways and highways and is produced by streetlights or the sudden appearance of a car bearing high beams or strong headlights. Situations like such maximize the danger, if the driver of a vehicle cannot see where (s)he is driving, how can (s)he know what's in front of the car. The blinding light that produces such sensation is truly one of the most dangerous aspects of light pollution on us.

Sky Glow Sky glow is a lit up night sky, and there are both natural and human causes. Natural causes are the sun's reflected light and stars. Electrically produced light increases the amount of sky glow to abnormal levels. Sky glow is created when particles of light either shoot up into the atmosphere or bounce into it from the ground; these particles then reflect the light creating a glowing sensation. Sky glow is responsible for unsatisfactory astronomers as well as distressed nocturnal animals.

Light Trespass Light Trespass is one of the three main types of light pollution, and a root for the other types to expand on.

Light entering unwanted areas (spill light) makes up this and is a huge problem with modern day lighting. Light Trespass is almost entirely due to the design and luminance of a light; it spills into unwanted areas when allowed to go wherever, – not checked by a shield or architectural structure – and when it unnecessarily bright. Corporate Gar and L gnat Pollution
Common day business practices and strategies lead to a lot of excess light. In order to attract consumers and buyers, businesses will go out of their way advertising themselves, and if it's not with the media it's with lights.

Whether it's with a lit up billboard, an exaggerated display representing them, or 24-hour lighting, it's wasteful and being done for one purpose: looking good and making an impression. Many businesses leave their lights on throughout the night (while they're not open) in order to let people know “ Hey! I'm here, remember it! ” It's a cheap form of advertising for them, and requires little to know work. One can imagine these owners hind that they can double or even triple the money spent on the overnight electricity bill with the money they make from those who pass by.

There are also those businesses who are trying to appeal more to your interests than your money. They'll fancy up their look with lightships, neon, LED lighting so that you'll remember, think it looks good, and come back and tell your friends. This is business at its finest though: make impressions and look better than the competition. It would be foolish to hope or aspire to change this practice, however, reducing the extent to which these places advertise with lighting is possible. Light pollution is especially bad in areas concentrated around tourism, nights out, and entertainment.

For example, Las Vegas, the “entertainment capital of the world” is a huge contributor to light pollution (Koch, Manning, Topiary). Being dubbed the brightest place on earth (ADSTAR) by NASA, Las Vegas is the largest offender of polluting the skies with light. The Las Vegas strip (as seen to the right) puts out the greatest amount of sky glow in the world – there is so much light pointing in every direction it is almost possible to confuse night and daytime. Las Vegas is not the only offender of this unnecessary output of light for attraction is unopposed.

The other top competitors are Tokyo, The US East Coast, the United Kingdom, as well as Chicago and the Californian docks. These places contribute greatly to the pollution. How Copious Light The obscene amount of light that we use affects our economy and is beginning to impact our health as well. The amount of light that we used to brighten buildings, businesses, and cities is far more than necessary. The International Dark Sky Organization estimates that Americans alone spend several billion dollars a year on lighting – How much of that do you think we could have saved by being a bit more restrictive with our lights.

Now, think about the economy. The country is slowly recovering from a large economic recession and is still very fragile.. Instead of wasting several billions of dollars on excess lighting, it could go towards funds that have not met sufficient goals. This varies state to state, however, federal funds should not be spent on lighting. For example, in 2011, college administrators and educational faculty across the United States saw budgets get slashed and fall in ways they never had before. The largest decline of state spending was seen across 2011 and 2012, averaging about 7. Percent. In the annual

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Grapevine Study conducted by the Illinois State University Center for the Study of Higher Education found that 41 states had one year declines up to 41 Percent! What makes the whole process so much more troublesome is that the country as a whole is trying to produce more degrees and more educated people, but cannot due to such cuts (Alderman). Now imagine, how much better the education system alone would be able to become if some of the money that was pent on wasteful lighting was put towards funding for education.

Light pollution is drain on our money which could be better invested and not wasted in creating lights for showboating. Light pollution is most commonly associated with nighttime, so studies have been done connecting patterns between this excess light at night (LANA) with various problems that could arise with one's health. The circadian rhythm, the human body's 24 hour time table and is programmed to function a certain way and release certain hormones and cause specific bodily functions based on that time table.

The large mount of LANA however has begun to play a large role in the disruption of the circadian rhythm. The unnaturally bright nights create delays and malfunctions in the endogenous melatonin release, which leads to sleeping, attention, and relaxation problems. These circadian disruptions and lack of melatonin have also been connected to an increased risk of breast cancer. In light of a lacking melatonin base, the body produces more estrogen, which in turn, increases the risk of getting breast cancer (Stevens).

Another connection was made between the lack of melatonin and weight-gain. In a study done by Ohio University students and Professor Dry.

Abraham Him (from the University of Haifa Biology in Israel) it was found that when exposed to dim lighting instead of a light-dark shift, the mice who received dim light (and therefore less melatonin) gained weight much faster than those who did not. They felt the need to correct their metabolism by eating in accordance with the light.

Although not yet confirmed, these results would prove that brighter nights trigger a need to eat in order to balance one's metabolism (to try and work with the circadian rhythm) and Hereford eat excess amounts of food. LANA – a use of light where it's not wanted – is in part a contributor to excessive weight gain, and raises the risk of obesity (Siegel- Ticklish). Light Pollution and Wildlife A lot of light pollutions most adverse effects take place on animals and the creatures that inhabit areas we've settled down in.

In England the expansion of lighting systems and light pollution (by 24% between 1993 and 2000) in the countryside complicate the lives of the indigenous lesser horseshoe bat. The artificial light has severed communal routes, stripped the bat of land, caused fragmentation which is making it much harder for the creature to forage and get the materials it needs to survive (Stone). Migratory birds are another victim of our protrusion into the world with artificial light.

As more sky piercing structures pop up, more lights popup; this is dangerous for birds which migrate at night. Night migrating birds rely on both visual cues and a magnetic compass to get where they're going. Their magnetic orientation is based off light receptors in the eye, and functions by taking in the wavelength of the reflected light to navigate. Not only are the birds now

taking in the avalanches of artificial light (which messes up their sense of direction), they are also relying on the visual cues of bright lights suspended in the air coming from tall buildings.

These two factors alone are both directly and indirectly responsible for many bird deaths and bird casualties whether it be from fatigue from flying around in the wrong direction, or from being harmed in the process of migration from crashing into the centers of lights – buildings, lighthouses, skyscrapers (Pot, En's, Varies). The most well-known victim of light pollution is the baby sea turtle. On beaches ND nesting grounds across the globe baby sea turtle emerge from their eggs with the instinct to make their way into the sea to reunite with their family.

Many of the newborn turtles use the light of the moon as a guide to get safely to the ocean, but that is no longer the case. The overwhelmingly bright lights of the city have started competing with the moon, many baby turtles instead of moving out towards sea, follow the city lights and move inward toward land, a huge danger. Baby sea turtles that move inward are exposed to many risks: getting stranded away from the ocean, eating hit by a vehicle, and they are exposed to the danger of the hustle-bustle of city life.

Scientists have found that the hatchings are more likely to respond to lights with greater wavelength and greater luminance, which meaner the bigger and brighter the light the more likely the sea turtles will move towards it (Alaskan, Kara, Swanker). As long as light pollution is increasing and nothing it being done sea turtles will continue to go towards the city. The flashing lights and sky glow that sets against the metal horizon continues to fool the

turtles and lure them to a hopeless death. The baby sea turtle is leading itself towards extinction with its artificially induced suicide marches.