



5th graders changing the world one footprint at a time

A vibrant sunset scene with a white text box. The sky is filled with colorful clouds in shades of orange, red, and purple, transitioning to a deep blue at the top. The sun is low on the horizon, casting a bright glow. The water in the foreground is calm, reflecting the colors of the sky. On the left side, there are dark silhouettes of trees. The text is centered within a white rectangular border.

Our mission.....

To make Dayton Elementary  
school more energy efficient  
to save money, and more  
importantly, our environment.

Our goal for this proposal



Our goal is to change our school structurally. We want to change our entire school's current lighting to energy efficient LED lighting. We can help save the environment and save a lot of money.

This upgrade is an effective way to reduce energy costs because LEDs use less energy. Even after the purchase of the needed LED lights, our school would save about \$9,000 the first year and about \$15,000 on electricity every year after that.

# Objectives

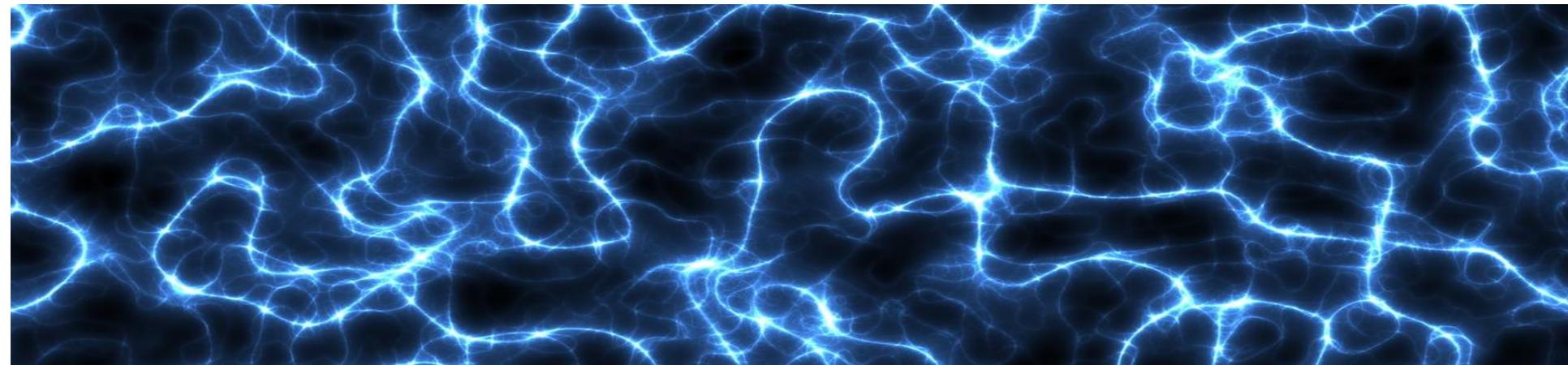
It is important to save money and the environment, LED lights are more energy efficient than fluorescent lights.

We can install LED bulbs in classrooms, restrooms, teachers lounge, the offices, and even outside. LED bulbs help the environment by not releasing pollution into the air. LED lights reduce heat so the air conditioners won't have to work as hard when it's hot outside.

LED lights also don't have mercury inside the bulbs but fluorescent lights have a little bit of mercury in the bulbs so we will save on the cost of disposal.

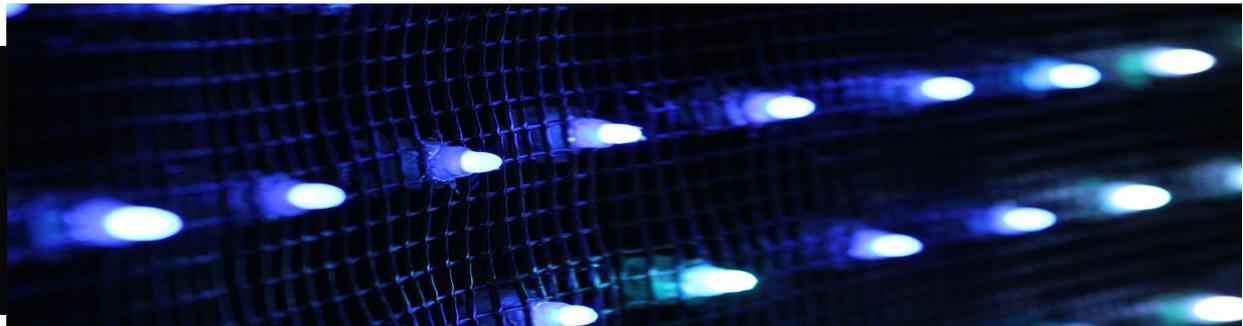
# Cost analysis

We conducted an energy analysis, and found that our current lighting uses almost 150,000 kWh annually. This leads to a cost of approximately \$24,000 per year on our electric bill. We calculated that if our current fluorescent lighting is changed to LED lighting we can reduce our annual kWh and our annual cost by thousands of dollars. This comes out to a savings of approximately 107,000 kWh and almost \$15,000.



# More data

We checked the amount of hours of all of the electricity together that way we will find the total amount of kilowatts in the items we checked. The cost of our proposal is \$11,224.23. That seems like a lot of money, but even after the cost of purchasing all of the LED lights, we would still save over \$9,000 the first year. The parts that we need are LED tubes and bulbs. We would need about 1,955 total lights for the whole school. We will also receive an NV Energy rebate which will save even more money up front. This will make our school better by lowering our school electricity bills. When the district sees how much money our school is saving, they might decide to make these changes in all of Lyon County schools!!



# How did we come up with all of this data?

Andrew DuMond-Energy Smart Schools did a presentation for our class. He taught us a lot about LED lighting and showed us how they work. He did a demonstration to show how easy it is to change the lights!

When he finished that, he taught us about all of the savings from changing to LED. There was A LOT of math to do! But, he gave us a really cool spreadsheet and taught us how to do it.

Then, we counted every light inside and outside the school and found out how many of each kind of light we need. We used our computers to make a big spreadsheet and Ms. B taught us how to do formulas so we wouldn't have to do all of the math by hand! Here is the result of all our hard work:

# Cost Analysis

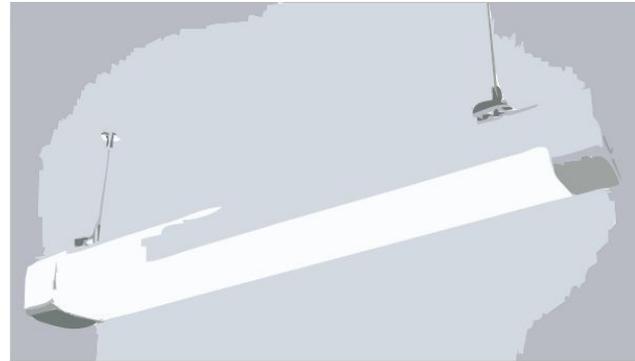
A	B	C	D	B - D = E	F	E x F = G	G/1000 = H	I	H x I = J	K	J x K = L	M	F x M = N
Existing lights	existing watts	replacement description	new watts	watts savings	number of fixtures	total watts saved	convert to kilowatts	hours of operation/yr	annual kWh saved	utility rate	annual savings \$	Cost per LED bulb/tube	Total cost of LED replacement
T8 4' dimming	28	4 ft. LED Tube - Hybrid A+B Type - 4000 Kelvin	8	20	164	3280	3.28	2700	8,856.00	0.14	\$1,239.84	\$5.71	\$936.44
T8 4' regular	28	4 ft. LED Tube - Hybrid A+B Type - 4000 Kelvin	8	20	1724	34480	34.48	2700	93,096.00	0.14	\$13,033.44	\$5.71	\$9,844.04
Incandescent bulb	75	LED 9w bulb	9	66	2	132	0.132	2700	356.40	0.14	\$49.90	\$0.93	\$1.86
Incandescent bulb	60	LED 9w bulb	9	51	16	816	0.816	2700	2,203.20	0.14	\$308.45	\$0.93	\$14.88
F17T8 tube	17	2' LED tube	8	9	9	81	0.081	2700	218.70	0.14	\$30.62	\$4.53	\$40.77
3' T* tube	30	3' LED tube	12	18	16	288	0.288	2700	777.60	0.14	\$108.86	\$5.66	\$90.56
4 pin CFL	42	4 pin LED	16	26	22	572	0.572	2700	1,544.40	0.14	\$216.22	\$13.44	\$295.68
Total annual savings									<b>107,052.30</b>		<b>\$14,987.32</b>		<b>\$11,224.23</b>
initial utility rebate = annual kwh saved x .05											<b>\$5,352.62</b>		
Total cost of replacement bulbs													
<b>Total 1st year savings = annual \$ saved + initial utility rebate - total cost of LED replacements</b>									<b>\$9,115.71</b>				

Andrew DuMond came to DES with some LED lights to show how they look. Him and Mr. Vismar, our maintenance man, changed half of the lights in our music room to LED. We went in to see if we could tell the difference. They looked a lot better!!!



# Some facts about LED lights

- LEDs can reduce power bills and it can reduce co2.
- LEDs do last longer than fluorescent lights.
- LEDs can last up to 22 years.
- LEDs don't get hot like incandescent and fluorescent lights
- Fun Fact: LEDs were first made in 2008.
- Fun Fact: Nick Holonyak jr. invented the first LED light that was a visible red light.



# There is a lot we can do, but we will need some help!

In order to change the fluorescent lighting to LED lighting we will need some help:

- Funding: We need help with the cost of purchasing all of the LED lighting
- We will need help from our administration, parents, maintenance, and even other students to get the lighting installed. Mr. DuMond showed us how easy it is to remove the old lights and put in the new lights - even us kids can do it!
- We believe with help, we can complete this project in less than a week

**WE ARE READY TO WORK!!!**

# What do LED lights have to do with the Environment?

Changing to LED lights can keep thousands of pounds of  $\text{CO}_2$  from the atmosphere and have a positive effect on global warming. Earth's temperature has risen due to more carbon dioxide and other chemicals.



# Pros

The pros of changing our lighting are:

- The school will save money on the electricity bill
- LED lights save more energy, and they last longer
- They save more CO<sub>2</sub> from going into the air
- The high quality lighting doesn't flicker like fluorescent lights do which can give people headaches.



# Cons

There are not that many cons to changing LEDs but here are a few. One of the cons are that we would have to change all the lighting in our school by hand. We also will have to keep buying LEDs to save DES money. Another con to switching to LEDs is that LEDs cost slightly more than the fluorescent so the price of the LED is slightly more but the savings will make up for the cost.



# How will we insure the project continues?

We will make make sure the project continues by continuing to buy the lights with the money we save on the school's electricity bill. We can also help encourage teachers and students to turn off lights when they are not in use so the life of the LEDs last longer, and we don't have to buy as many more.

We can also help teach more people about energy efficiency and how important it is for our planet.



# What Good Are LED Lights?

Dayton Elementary School uses a lot of energy.

Using fluorescent light is unhealthy for the environment. Changing to LED lighting will help us save the environment. They can also help save the school a lot of money with the energy bills.

Ms. Borremans inspired us to attempt and accomplish this project.

