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In this experiment, you will understand the effect of light pollution and how it affects what you see in the sky. You will need to observe the sky and record how many stars you see in two different cases, one with a lot of light pollution and one without.



But, what is light pollution?

Any source of artificial light that does not come from nature contributes to light pollution. For example, street lights, traffic lights, buildings are all sources of light pollution. The moon, Sun, and stars do not contribute to light pollution because their light comes from nature.



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Materials needed



Any cylindrical tube (e.g.
toilet roll tube or
aluminum foil tube)



Calculator



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Steps

Make sure when you are observing the sky, there are no clouds so you can see the stars clearly.

You will need to do the same steps for TWO different nights.



Night one: with light pollution

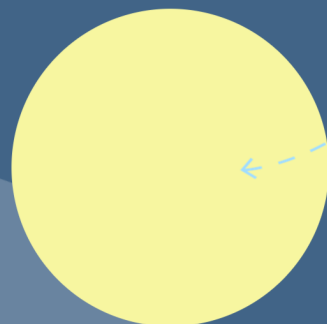


1. Gather your materials and step to a location outside with a clear view of the sky
2. Write down all the sources of light pollution that you see around you (e.g. light from buildings, cars or street lamps)
3. Use the tube like a telescope and point it at the sky. Look through it and count the stars that you see. Try not to shake the tube and hold it tight when you see
4. Repeat step 3, three more times, but pointing the tube at different parts of the sky for each time
5. Record your observations below

Sources of light pollution seen	
Night one location	
Trial one (number of stars seen)	
Trial two (number of stars seen)	
Trial three (number of stars seen)	
Trial four (number of stars seen)	

6. Calculate the average number of stars that you saw.

Average number of stars = (trial 1 + trial 2 + trial 3 + trial 4) / 4



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Steps



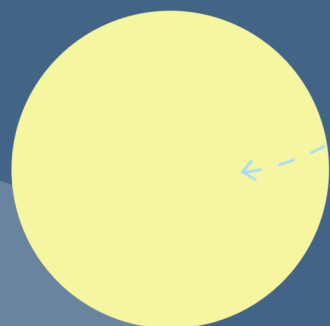
Night two: darker location, with less light pollution (e.g. desert, park, beach, or anywhere further from city lights)



1. Gather your materials and step to a location outside with a clear view of the sky
2. Write down all the sources of light pollution that you see around you (e.g. light from buildings, cars or street lamps)
3. Use the tube like a telescope and point it at the sky. Look through it and count the stars that you see. Try not to shake the tube and hold it tight when you see
4. Repeat step 3, three more times, but pointing the tube at different parts of the sky for each time
5. Record your observations below

Sources of light pollution seen	
Night one location	
Trial one (number of stars seen)	
Trial two (number of stars seen)	
Trial three (number of stars seen)	
Trial four (number of stars seen)	

6. Calculate the average number of stars that you saw.
$$\text{Average number of stars} = (\text{trial 1} + \text{trial 2} + \text{trial 3} + \text{trial 4}) / 4$$



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Results

Compare the average number of stars seen on both nights



**Night one
(more light pollution)**



**Night two
(less light pollution)**



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Which night has more stars?

The answer is that we have the same number of stars on both nights, but light pollution affects how many stars our eyes can see. The more light pollution there is, the harder it is to find stars in the sky! This is because when there are light sources closer to you, they outshine the light that comes from stars which are much further away. This is why the sky in bright cities appear to have less stars

Credits given to
How to Win a Nobel Prize by Barry Marshall
for the experiment design.



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