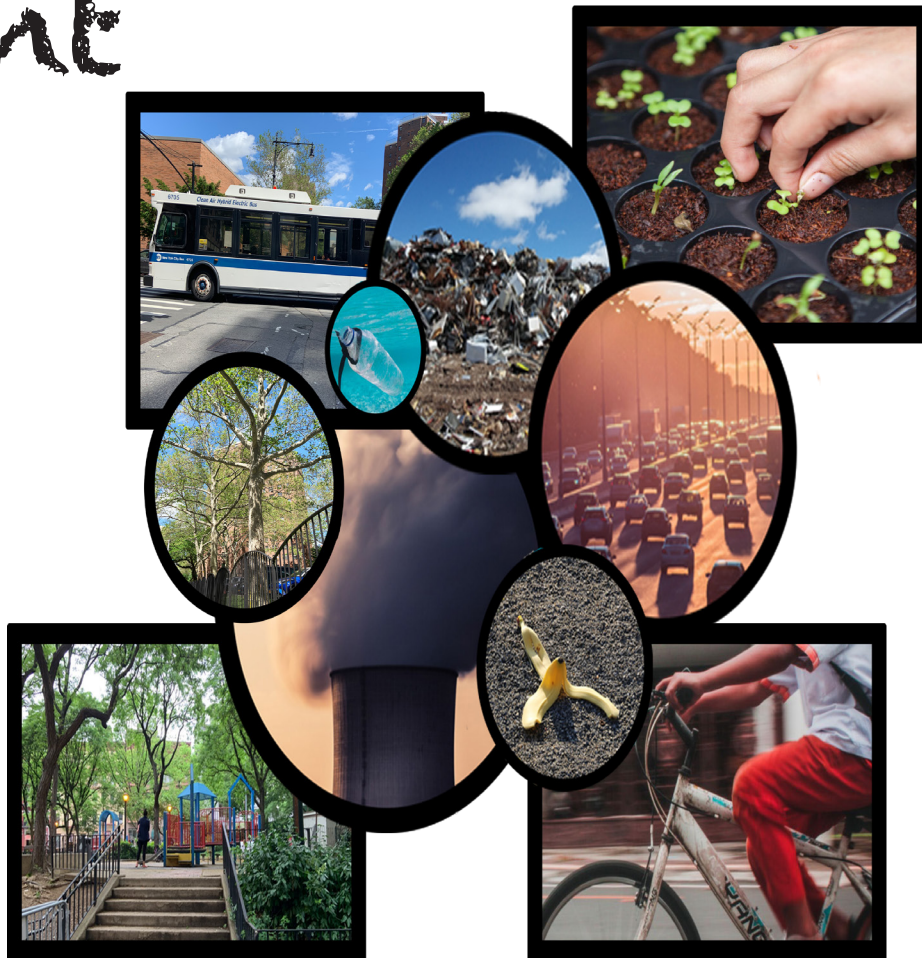


Environmental Scavenger Hunt



 Icahn School of Medicine
at Mount Sinai

 DR. LUZ CLAUDIO
WRITE SCIENCE NOW

HUNT IN YOUR HOME, SCHOOL AND NEIGHBORHOOD

CONTENTS

DEAR ADVENTURER

HUNT IN YOUR NEIGHBORHOOD

GREEN SPACES

LIGHTBULB TECHNOLOGY

HUNT IN YOUR HOME

GET INVOLVED

HUNT IN YOUR SCHOOL

WRITE YOUR NOTES

REFERENCES

DR. LOU CLAUDIO

HUNT IN YOUR HOME?

Light Bulbs of Modern & Smart World

GO AROUND YOUR HOME AND IDENTIFY WHICH KIND OF LIGHTBULB TECHNOLOGY YOU USE THE MOST.

LIVING ROOM LAMP

ATTIC LAMP

BEDROOM LAMP

DESK LAMP

CEILING FAN LAMP

DECORATIVE LAMP

KITCHEN LAMP

HALL LAMP

BATHROOM LAMP

OUTDOOR LAMP

QUANTIFY HOW MANY LIGHTBULBS YOU HAVE IN YOUR HOME BY THEIR TYPE OF TECHNOLOGY.

LED

FLUORESCENT

HALOGEN

INCANDESCENT

Value

Value

Value

Value

Single		
Power in watts	Energy in kilowatt-hours	Electricity cost (\$0.12/kWh)
40w	0.4	\$0.48 per hour
60w	0.6	\$0.72 per hour
75w	0.75	\$0.90 per hour
100w	1.0	\$1.20 per hour
150w	1.5	\$1.80 per hour
200w	2.0	\$2.40 per hour

Incandescent is worse!		
Power in watts	Energy in kilowatt-hours	Electricity cost
40w	0.4	\$0.48 per hour
60w	0.6	\$0.72 per hour
75w	0.75	\$0.90 per hour
100w	1.0	\$1.20 per hour
150w	1.5	\$1.80 per hour
200w	2.0	\$2.40 per hour

NOTE: THE LIGHTBULB POWER YOU SEE ABOVE IS THEIR POWER BY WATTS.

BASED IN THE TYPE OF TECHNOLOGY THAT HELPS SAVE ENERGY!

Filename:

File: Lamps & bulbs.rtf,696

Electricity cost: 12¢ per kilowatt-hour (in your state, please - MAY VARY 22¢/kWh)

DO YOU KNOW?

"ELECTRICITY USE IS MEASURED IN WATTS. NEWER ENERGY-EFFICIENT LIGHTBULBS SUCH AS LED PRODUCE THE SAME AMOUNT OF LIGHT WHILE USING LESS ELECTRICITY AND REDUCING CO2 EMISSIONS" (GRAY, SARRIS, MIN & CHEN, 2013)



HUNT IN THE NEIGHBORHOOD



GO AROUND YOUR NEIGHBORHOOD AND IDENTIFY HOW MANY ITEMS YOU CAN COUNT IN 100 STEPS.

TREES

BIKE RACKS

MUSIC POLLUTION

VEHICLES

FEED FOOD

RECYCLING CANS

TRASH CANS OVERFLOWING

CLEAN AIR VEHICLES
ELECTRIC BUS

STREETWALKS

PARKS

SMOKESTACKS

OVERFLOWING
SENSE

DID YOU KNOW?

• TYPICAL CAR EMITS
 2.6 METRIC TON OF CARBON
 DIOXIDE PER YEAR. (USA EPA, 2019)
 • AIR POLLUTION FROM CARS MAY CONTRIBUTE
 OVER 700 EMERGENCY ROOM VISITS
 IN NEW YORK CITY HOSPITALS PER YEAR.
 (NEEDHAM ET AL 2014)
 • ON AVERAGE, THE US GENERATES
 OVER 4 POUNDS OF TRASH PER PERSON
 PER DAY, MORE THAN ANY OTHER
 COUNTRY. BUT ONLY ABOUT
 THIRD OF THIS TRASH IS RECYCLED.
 (USA EPA, 2019)



LEGEND

- LANDSCAPES
- GREENSPACES
- NEIGHBORHOOD AIR QUALITY
- NITROGEN DIOXIDE (NO₂)

NO ₂ Level	Range
High	12.0 - 17.0
Medium	17.0 - 18.0
Low	18.0 - 19.3
Very Low	19.3 - 21.4
Extremely Low	21.4 - 24.6

NEW YORK CITY



PR. LUZ CLAUDIO
SCHOOL OF THE FUTURE

HUNT IN YOUR SCHOOL



SCHOOL OF THE FUTURE
IN THE 21ST CENTURY

BE PROMOTIVE IN YOUR SCHOOL AND TO ACTIVITIES THAT CAN HELP WITH THE REDUCTION OF ENVIRONMENTAL ISSUES AND IMPROVE YOUR HEALTH.

INVITE YOUR FRIENDS AND TEACHERS TO BE PART OF THE MOVEMENT TO CREATE AWARENESS ABOUT NON LITTLE ACTIONS CAN POSITIVELY IMPACT YOUR HEALTH AND ENVIRONMENT.



GET INVOLVED WITH
YOUR SCHOOL'S GARDEN



TAKE THE BUS



RIDE A BIKE
TO SCHOOL



RECYCLE PLASTIC



HELP WITH
COMFORTING



RECYCLE CARTON



REDUCE THE USE OF
PLASTIC WATER BOTTLES



TURN OFF THE LIGHTS
BEFORE YOU GO TO SCHOOL



DO PHYSICAL ACTIVITIES

DID YOU KNOW?

IF YOU BIKE YOU EMIT 4-8 TIMES LESS CARBON DIOXIDE PER KILOMETER THAN BY TAKING A TYPICAL CAR.

WASTE CAN END UP IN LANDFILLS OR SEAS.

IT IS BEST TO CHOOSE ITEMS THAT DON'T HAVE A LOT OF PACKAGING, AND REDUCE YOUR USE OF THINGS THAT YOU ONLY USE ONCE, LIKE WATER BOTTLES, SHOPPING BAGS, OR STRAWS.

IT IS BETTER TO RECYCLE EVERYTHING YOU CAN.



WASTE




POLLUTION



DEAR ADVENTURER

Embark on the adventure that is the
ENVIRONMENTAL SCAVENGER HUNT.

Here you will find activities that you can do and invite others to do with you in your home, school and neighborhood. Enjoy the journey, have fun, and be creative with the environmental topics that you are going to encounter. Learn, help, educate and take action!

HUNT IN THE NEIGHBORHOOD

GO AROUND YOUR NEIGHBORHOOD AND IDENTIFY HOW MANY ITEMS YOU CAN COUNT IN 100 STEPS.



☐ TREES



☐ BIKE RACKS



☐ NOISE POLLUTION



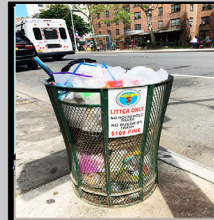
☐ VEHICLES



☐ FRESH FOOD



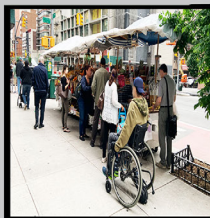
☐ RECYCLING CANS



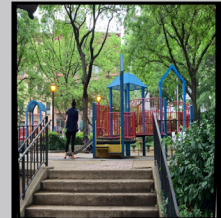
☐ TRASH CANS OVERFLOWING



☐ CLEAN AIR HYBRID ELECTRIC BUS



☐ SIDEWALKS



☐ PARKS



☐ SMOKESTACKS



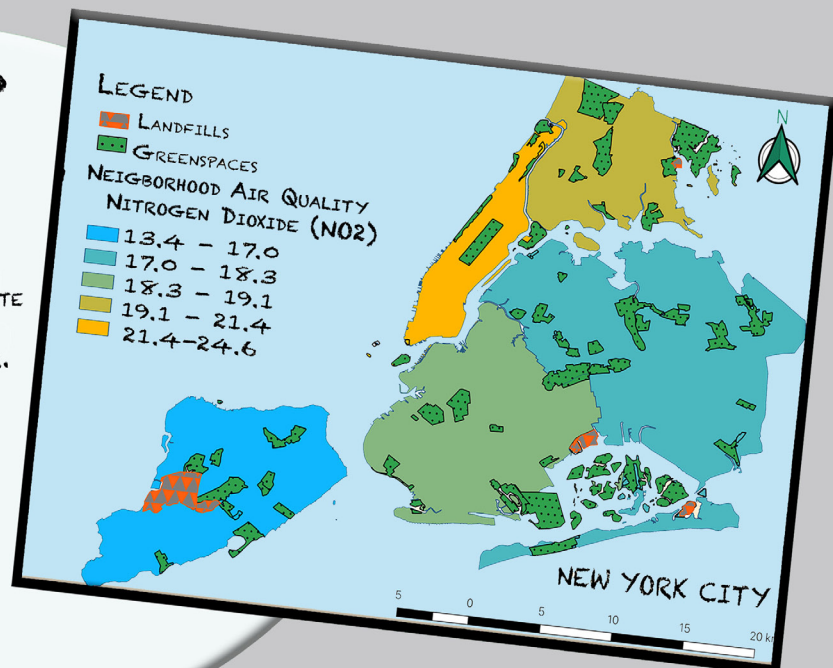
☐ OVERFLOWING SEWER

DID YOU KNOW?

A TYPICAL CAR EMITS
4.6 METRIC TONS OF CARBON
DIOXIDE PER YEAR. (USA EPA, 2018)

AIR POLLUTION FROM CARS MAY CONTRIBUTE
TO OVER 700 EMERGENCY ROOM VISITS
TO NEW YORK CITY HOSPITALS PER YEAR.
(KHEIRBECK ET AL, 2016)

ON AVERAGE, THE US GENERATES
OVER 4 POUNDS OF TRASH PER PERSON
PER DAY, MORE THAN ANY OTHER
COUNTRY. BUT ONLY ABOUT
A THIRD OF THIS TRASH IS RECYCLED.
(USA EPA, 2018)



GREEN SPACES

"Urban trees have more impact on air quality by storing carbon and removing air pollution than they do producing oxygen."

(Nowak, Crane & Hoeh, 2007)

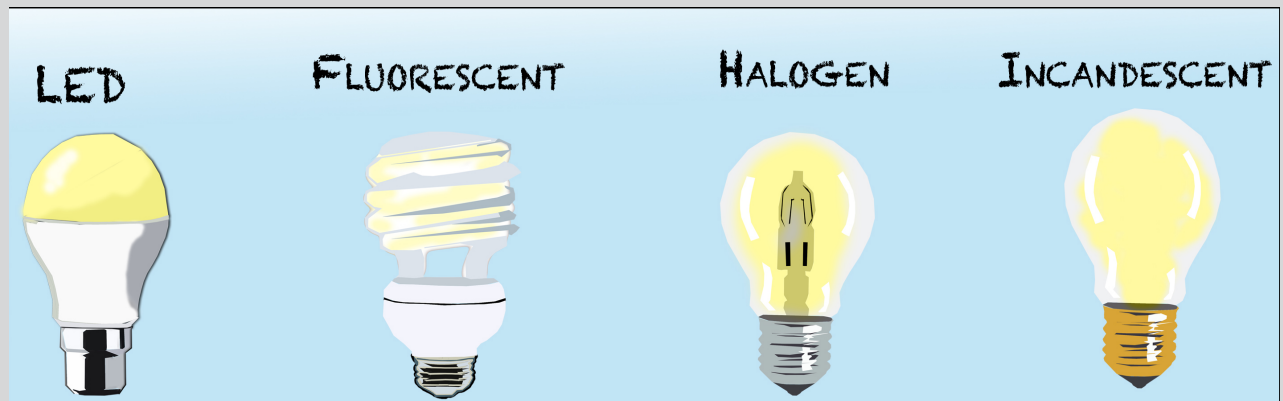
Urban trees also help cool the temperature in the city, especially in summer months. This can bring down the energy consumption during summer. Trees and plants provide habitat for insects and birds. But to have a very significant impact from trees in the city environment, you have to have a lot of trees. Therefore, it is important that your city not only have these trees along the sidewalks, but also trees in forest and parks.

Cigarette Butts



Seeing cigarette butts on the ground in your community may mean that there's a lot of people who smoke. Of course, you know that cigarette smoke is known to cause cancer in the people who smoke, but did you know that it has also been associated with many negative health effects in children who may be exposed to it from people who smoke. For example, it can trigger symptoms of asthma. Also, guess where cigarette butts end up after they lay on the ground for a while? They are carried in drain water and ultimately end up either in the sewer system, or oceans and beaches.

LIGHTBULB TECHNOLOGY



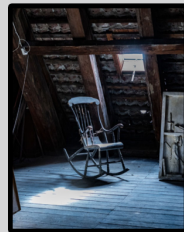
Why are lightbulbs related to CO₂ emissions? If you are asking yourself that question, the answer is through the use of electricity and fossil fuel combustion. The energy used in households comes from burning fossil fuels. When fossil fuels are burned, they released a gas named carbon dioxide, which affects the global temperature balance, human health, and environment. Electricity use is measured in watts. Newer energy-efficient lightbulbs provide the same amount of light and last longer while consuming less electricity. If you cannot switch all the bulbs to LED technology, change them in the areas where you spend more time at home. Also, remember to always turn off the lights before you leave your home!

HUNT IN YOUR HOME

GO AROUND YOUR HOME AND IDENTIFY WHICH KIND OF LIGHTBULB TECHNOLOGY YOU USE THE MOST.



☐ LIVING ROOM
LAMP



☐ ATTIC LAMP



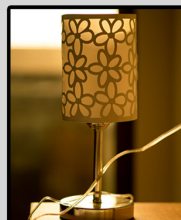
☐ BEDROOM
LAMP



☐ DESK LAMP



☐ CEILING FAN
LAMP



☐ DECORATIVE
LAMP



☐ KITCHEN
LAMP



☐ HALL LAMP



☐ BATHROOM
LAMP



☐ OUTDOOR LAMP

QUANTIFY HOW MANY LIGHTBULBS YOU HAVE IN YOUR HOME BY THEIR TYPE OF TECHNOLOGY.

LED



Total

FLUORESCENT



Total

HALOGEN



Total

INCANDESCENT



Total

Guide		
Power in watts	Energy in Kilowatt-hours	Electricity cost (\$0.12) United States Avg.
10w	0.01	\$0.43 per year
30w	0.03	\$1.29 per year
50w	0.05	\$2.16 per year
70w	0.07	\$3.02 per year
100w	0.10	\$4.32 per year

Calculate it yourself		
Power in watts	Energy in Kilowatt-hours	Electricity cost

RATE THE LIGHTBULBS FROM LOW TO HIGH BY THEIR POWER OF WATTS.
WHICH IS THE TYPE OF TECHNOLOGY THAT NEEDS LESS POWER ELECTRICITY?

FORMULAS:
 $KWh = (WATTS \times HOURS) / 1,000$
 ELECTRICITY COST = KWh X (ENERGY COST IN YOUR STATE PER HOUR A DAY PER 12 MONTHS)

DID YOU KNOW?

"ELECTRICITY USE IS MEASURED IN WATTS. NEWER ENERGY-EFFICIENT LIGHTBULBS SUCH AS LED PRODUCE THE SAME AMOUNT OF LIGHT WHILE USING LESS ELECTRICITY AND REDUCING CO2 EMISSIONS" (GAN, SAPAR, MUN & CHONG, 2013)

GET INVOLVED

ONE OF THE BEST WAYS TO STOP OR REDUCE ENVIRONMENTAL ISSUES IS TO BE ABLE TO IDENTIFY IN YOUR SURROUNDINGS THOSE THINGS AND BEHAVIORS THAT ARE CONTRIBUTING TO THE PROBLEM. WE BELIEVE THAT LITTLE ACTIONS CAN RESULT IN BIG SOLUTIONS.



Talk

Talk with your family, friends, neighbors, and teachers about what you learned about environmental concerns and talk about ideas that can help your home, school, or neighborhood.



ACT

Challenge yourself to make activities that help the environment. You can plant a tree, do a recycling campaign at your school or neighborhood, or make compost at your home.



SHARE

Share with others what are you doing and ask them to join!

HUNT IN YOUR SCHOOL

BE PROACTIVE IN YOUR SCHOOL AND DO ACTIVITIES THAT CAN HELP WITH THE REDUCTION OF ENVIRONMENTAL ISSUES AND IMPROVE YOUR HEALTH.
INVITE YOUR FRIENDS AND TEACHERS TO BE PART OF THE MOVEMENT TO CREATE AWARENESS ABOUT HOW LITTLE ACTIONS CAN POSITIVELY IMPACT YOUR HEALTH AND ENVIRONMENT.



GET INVOLVED WITH
YOUR SCHOOL'S GARDEN



TAKE THE BUS



RIDE A BIKE
TO SCHOOL



RECYCLE PLASTIC



HELP WITH
COMPOSTING



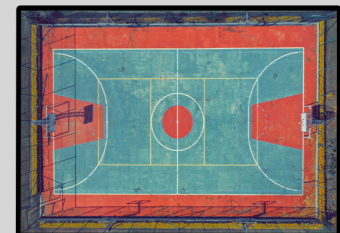
RECYCLE CARTON



REDUCE THE USE OF
PLASTIC WATER BOTTLES



TURN OFF THE LIGHTS
BEFORE YOU GO TO SCHOOL



DO PHYSICAL ACTIVITIES

DID YOU KNOW?



POLLUTION

IF YOU BIKE YOU EMIT 4-5
TIMES LESS CARBON DIOXIDE
PER KILOMETER THAN BY
DRIVING A TYPICAL CAR.

WASTE CAN END UP IN LANDFILLS OR SEAS.
IT IS BEST TO CHOOSE ITEMS THAT DON'T HAVE A LOT OF PACKAGING,
AND REDUCE YOUR USE OF THINGS THAT YOU ONLY USE ONCE,
LIKE WATER BOTTLES, SHOPPING BAGS, OR STRAWS.
IT IS BETTER TO RECYCLE EVERYTHING YOU CAN.



WASTE

[illegible]

REFERENCES

- Abdel-Shafy, H., & Mansour, M. (2018). Solid waste issue: Sources, composition, disposal, recycling and valorization. *Egyptian Journal Of Petroleum*, 27, 1275-1290.
- Achakulwisut, P., Brauer, M., Hystad, P. and Anenberg, S. (2019). Global, national, and urban burdens of paediatric asthma incidence attributable to ambient NO₂ pollution: estimates from global datasets. *The Lancet Planetary Health*, 3(4), pp.e166-e178.
- Araújo, M., & Costa, M. (2019). A critical review of the issue of cigarette butt pollution in coastal environments. *Environmental Research*, 172, 137-149. doi: 10.1016/j.envres.2019.02.005
- Bin, S., & Dowlatabadi, H. (2005). Consumer lifestyle approach to US energy use and the related CO₂ emissions. *Energy Policy*, 33(2), 197-208. doi: 10.1016/s0301-4215(03)00210-6
- BRENNAN RAMIREZ, L., HOEHNER, C., BROWNSON, R., COOK, R., ORLEANS, C., & HOLLANDER, M. et al. (2006). Indicators of Activity-Friendly Communities An Evidence-Based Consensus Process. *American Journal Of Preventive Medicine*, 31(6), 515-524. doi: 10.1016/j.amepre.2006.07.026
- Carlson, S., Heimlich, J., & Storksdiel, M. (2011). Validating an Environmental Education Field Day Observation Tool. *International Electronic Journal Of Environmental Education*, 1(3), 151-165.
- Di Stefano, J. (2000). Energy efficiency and the environment: the potential for energy efficient lighting to save energy and reduce carbon dioxide emissions at Melbourne University, Australia. *Energy*, 25(9), pp.823-839.
- Dietz, T., Gardner, G., Gilligan, J., Stern, P. and Vandenberg, M. (2009). Household actions can provide a behavioral wedge to rapidly reduce US carbon emissions. *Proceedings of the National Academy of Sciences*, 106(44), pp.18452-18456.
- Fu, D., Bu, B., Wu, J., & Singh, R. (2019). Investigation on the carbon sequestration capacity of vegetation along a heavy traffic load expressway. *Journal Of Environmental Management*, 241, 549-557. doi: 10.1016/j.jenvman.2018.09.098
- Eljošiūtė, E., Balciukevičiūtė, J., & Denafas, G. (2012). Life Cycle Assessment of Compact Fluorescent and Incandescent Lamps: Comparative Analysis. *Environmental Research, Engineering And Management*, 61(3). doi: 10.5755/j01.ere.61.3.2425
- Environment & Health Data Portal (Neighborhood Air Quality Nitrogen Dioxide). (2017). Retrieved from <http://a816-doh.besp.nyc.gov/IndicatorPublic/VisualizationData.aspx?id=2025,719b87,122,Summarize>

Gan, C., Sapor, A., Mun, Y., & Chong, K. (2013). Techno-Economic Analysis of LED Lighting: A Case Study in UTeM's Faculty Building. *Procedia Engineering*, 53, 208-216. doi: 10.1016/j.proeng.2013.02.028

Greenhouse Gas Emissions from a Typical Passenger Vehicle | US EPA. (2018). Retrieved from <https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle>

Kheirbek, I., Haney, J., Douglas, S., Ito, K., & Matte, T. (2016). The contribution of motor vehicle emissions to ambient fine particulate matter public health impacts in New York City: a health burden assessment. *Environmental Health*, 15(1). doi: 10.1186/s12940-016-0172-6

Lee, A. (2000). Verification of electrical energy savings for lighting retrofits using short- and long-term monitoring. *Energy Conversion and Management*, 41(18), pp.1999-2008.

Lee, W., & Lee, C. (2015). Developmental toxicity of cigarette butts – An underdeveloped issue. *Ecotoxicology And Environmental Safety*, 113, 362-368. doi: 10.1016/j.ecoenv.2014.12.018

National Overview:Facts and Figures on Materials, Wastes and Recycling | US EPA. (2018) Retrieved from <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials>

Neckerman, K., Lovasi, G., Davies, S., Purciel, M., Quinn, J., & Feder, E. et al. (2009). Disparities in Urban Neighborhood Conditions: Evidence from GIS Measures and Field Observation in New York City. *Journal Of Public Health Policy*, 30(S1), S264-S285. doi: 10.1057/jphp.2008.47

Nowak, D., Crane, D., & Hoeh, R. (2007). Oxygen Production by Urban Trees in the United States. *Arboriculture & Urban Forestry*, 33(3), 220-226.

Nowak, D., Hoehn, R., & Crane, D. (2007). Oxygen Production by Urban Trees in the United States. *Arboriculture & Urban Forestry*, 33, 220-226.

Nowak, D. (2002). The effects of urban trees on air quality. *USDA Forest Services*, 1-4.

NYCCAS infographic. (2019). Retrieved from <http://a816-dohbesp.nyc.gov/IndicatorPublic/Traffic/index.html> [Accessed 22 May 2019]

Mahlia, T., Said, M., Masjuki, H. and Tamjis, M. (2005). Cost-benefit analysis and emission reduction of lighting retrofits in residential sector. *Energy and Buildings*, 37(6), pp.573-578.

Masjuki, H., Mahlia, T. and Choudhury, I. (2001). Potential electricity savings by implementing minimum energy efficiency standards for room air conditioners in Malaysia. *Energy Conversion and Management*, 42(4), pp.439-450.

Min, G., Mills, E. and Zhang, Q. (1997). Energy efficient lighting in China. *Energy Policy*, 25(1), pp.77-83.

Munawar, M. (2018). Human health and environmental impacts of coal combustion and post-combustion wastes. *Journal Of Sustainable Mining*, 17(2), 87-96. doi: 10.1016/j.jsm.2017.12.007

Roder Green, A., Putschew, A., & Nehls, T. (2014). Littered cigarette butts as a source of nicotine in urban waters. *Journal Of Hydrology*, 519, 3466-3474. doi: 10.1016/j.jhydrol.2014.05.046

Sharifi, A., & Murayama, A. (2013). A critical review of seven selected neighborhood sustainability assessment tools. *Environmental Impact Assessment Review*, 38, 73-87. doi: 10.1016/j.eiar.2012.06.006

The Residential Energy Consumption Survey. (2019). Retrieved from <https://www.rti.org/impact/residential-energy-consumption-survey>

Trifunovic, J., Mikulovic, J., Djuricic, Z., Djuric, M. and Kostic, M. (2009). Reductions in electricity consumption and power demand in case of the mass use of compact fluorescent lamps. *Energy*, 34(9), pp.1355-1363.

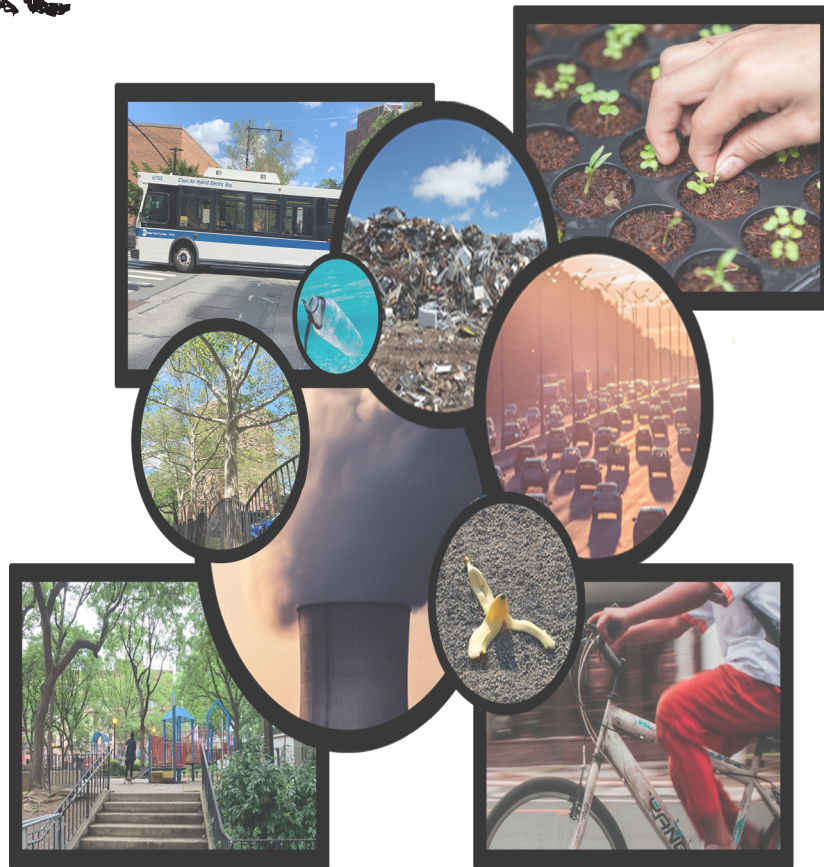
Map Shapefiles:

2010 New York City Borough Boundaries - GeoData @ UCB. (2010). Publisher: New York (City) Department of City Planning. Retrieved from https://geodata.lib.berkeley.edu/catalog/nyu_2451_34154

2010 New York City Greenspace - GeoData @ UCB. (2010). Retrieved from https://geodata.lib.berkeley.edu/catalog/nyu_2451_34493

Directory of Landfills. (2018). Retrieved from <https://data.cityofnewyork.us/City-Government/Landfills/6gvx-hydd>

Environmental Scavenger Hunt



 Icahn School of Medicine
at Mount Sinai



DR. LUZ CLAUDIO
WRITE SCIENCE NOW

HUNT IN YOUR HOME, SCHOOL AND NEIGHBORHOOD