WASTE DEEP 1

OVERVIEW Examining the Issues

HOW DO YOU SPARK STUDENT INTEREST IN WASTE?

By using our Issue Cards! **Issue Cards are over 65 printable quotes, statistics, graphs, maps, definitions, excerpts, cartoons and photographs**. In groups, students will examine this content to gain a multidisciplinary understanding of waste and its relationship to current economic, social and environmental issues in New York City and the world. The Cards—also available as PowerPoint slides—are organized into five sets: Consumerism, Justice & Equity, Non-Renewable Resources, "Away," and a History of Waste in NYC. The size of your class, the dynamics and learning styles of your students and the amount of time you would like to spend with the Cards can guide the way your students use them. Here is one successful method:

Students Break into 5+ Groups

Each group receives a unique set of Issue Cards. Students spend time examining the content of their group's cards and begin to form reactions.

Students Complete Individual Response Slips

After examining their set of Issue Cards, students complete Response Slips to express what they think, feel or wonder about the information of one or more Cards.

Groups Construct a Poster and Present to the Class

In their groups, students share their reactions to the content, identify common themes and work together to create a poster to be shared with and presented to the rest of the class.

WASTE DEEP 1

LESSON PLAN Examining the Issues

In *Waste Deep* 1, students evaluate different media—quotes, statistics, definitions, lyrics, political cartoons and images—to gain a deeper understanding of the bigger implications of their waste and its relationship to current economic, social, and environmental issues in New York City and the world beyond.

STANDARDS: **Common Core ELA** RST.11-12.2, SL.11-12.4, RST.11-12.7; **Living Science Scope and Sequence** Key Idea 7; **NGSS** HS-ESS3-1

OBJECTIVE

Students evaluate a set of cards to identify a common theme and then integrate the cards into a poster that includes their own personal reflections.

After this activity students will be able to:

- ✓ Identify a main theme from multiple sources of information
- ✓ Clearly and concisely present supporting evidence for the identified theme
- ✓ Articulate how human consumption patterns influence resource usage and impact ecosystems

TIME REQUIRED

1 to 2 45-minute class periods

PROCEDURE

Small groups of students each develop expertise in one issue area and present that information, in a poster, to their peers.

I. **Warm Up** a brief exercise to immediately engage students and help them identify their current relationship with waste.
II. **Scratching the Surface** students form into Expert Groups and brainstorm current words they associate with waste.
III. **Going Deeper** students analyze Waste Deep Issue Cards, record their reactions, and assemble a poster using the cards and responses.
IV. **Poster Presentations** students present posters to peers, summarizing their issue area through title, definition, and responses.
V. **Wrap Up** teacher facilitates a discussion about the issues explored and their connections to each other.

MATERIALS NEEDED

Teacher Materials/Setup

- Digital Issue Cards Slide Deck (optional)
- Smartboard or projector (optional)

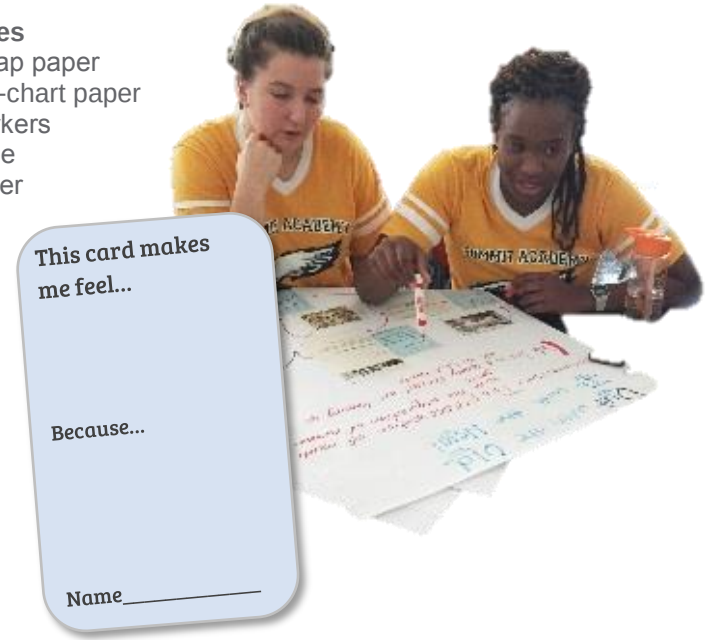
Arrange class so that up to five groups of students can work together.

Student Handouts

- Sets of five different themed Issue Cards
- 30-50 Student Response Cards
- Exit Cards (1 per student)
- Waste Journal (1 per student)

Supplies

- Scrap paper
- Flip-chart paper
- Markers
- Tape
- Timer



I. WARM UP

Ask students to stand and to remain standing if any of the following statements apply to them.

- Stay standing if you threw something away in the last 24 hours.
- Stay standing if you thought about which bin you threw that item into.
- Stay standing if you thought about where that item will go.

If any students remain standing, ask them to share their thoughts on the item they threw away.

Introduce the rest of the lesson:

We often don't think about the waste we create, where it comes from and what happens after we discard it. Today, we will take a deeper look and explore the economic, social, and environmental implications of waste.

II. SCRATCHING THE SURFACE

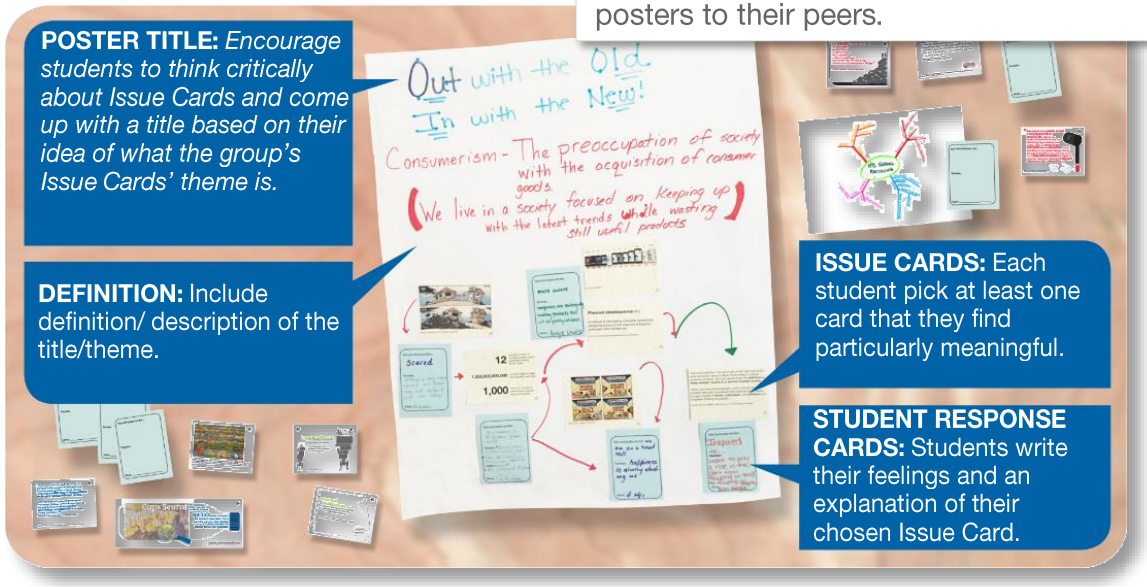
Assign students to five Expert Groups. Ask groups to brainstorm words they associate with waste. Save this initial brainstorm so that students can look back at their original associations after completing the activity to see if they learned anything new.

III. GOING DEEPER

Students work in groups to make a poster based on a set of Issues Cards related to a theme around waste.

1. Have students form into Expert Groups. If using all 5 sets of Issue Cards, count off by fives. Instruct groups to meet at different stations around the room.
2. Provide to each Expert Group:
   a) 1 set of Issue Cards
   b) ~10 Student Response Cards
   c) 1 piece of flip-chart paper
   d) Markers and tape
3. Ask students to silently read and evaluate each of the Issue Cards in their set, passing cards to the next person until everyone in their group has viewed every card.
4. Instruct each student to pick at least one card they find particularly meaningful and fill out a Student Response Card for that Issue Card.
5. Ask students to make a poster that includes a title, definition of their Issue Card theme, Issue Cards selected by each student and their Response Cards (see example below).
6. Inform students that, as "experts", they must be prepared to share key information with their peers about their Issue area during the Student Presentations (i.e. title, description, Expert Group's feelings and discussion points)

Expert Groups create a poster using their issue cards and responses to the issues cards. After making the poster, experts present their posters to their peers.



IV. POSTER PRESENTATIONS

Students return to their seats for Expert Group poster presentations.

1. Instruct students to return to their seats.
2. Explain the Poster Presentations: Expert Groups will spend 2-3 minutes presenting their poster in front of the class. Each Expert Group's presentation should include the following:
   a) Title/Theme
   b) Definition/Description
   c) Summarize Expert Group's feelings and main discussion points
   d) Field reactions to the theme/cards from rest of class
3. Instruct each student to fill out an Exit Card at the end of the Poster Presentations.

V. WRAP UP

1. Remind students that this lesson addressed various issues around waste.

2. Connect students' poster topics with the intended theme for each Issue Card set.

3. Facilitate a discussion about the issues and their connections.

- What is one thing you learned from your own Expert Group?
- What is one thing you learned from another Expert Group?
- How are each of these issues from the different posters connected to one another?
- What are some examples of these issues that you have encountered in your life? Something you've seen? Heard? Read? Experienced?
- Looking at your original waste brainstorm, do you have any additional words to add?
- What can you do starting today to address the issues you identified?

4. Conclude with a reminder to recycle in the classroom, cafeteria, and outside of school.

EXTENSION

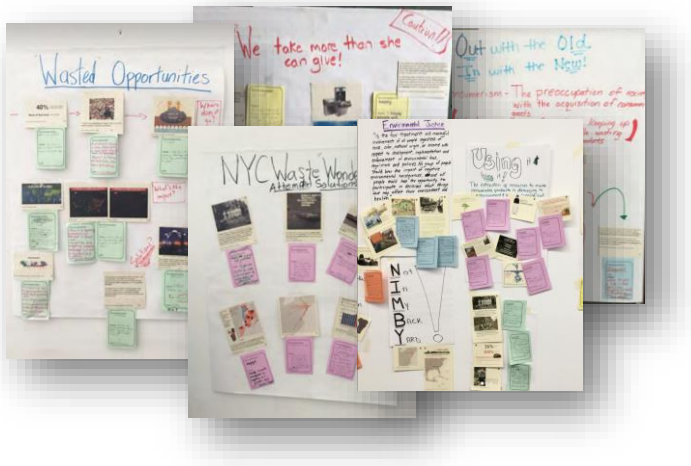
Distribute a Waste Journal to all students.

- Have students keep track of what they use and dispose for a day in their Waste Journal.

CHECK FOR UNDERSTANDING

Review posters and Exit Cards to ensure the lesson objective was met.

- ✓ Were students able to define the theme of their Issues cards?
- ✓ Were students able to draw conclusions from their issues cards?
- ✓ Did students add anything to their initial waste brainstorm sheet



Continue the Waste journey in *Waste Deep 2:* Understanding New York City!

To download Waste Deep materials, check out our website:
www.grownyc.org/rcp/wastedeep

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This card makes me feel...

because...

Name _____

This card makes me feel...

because...

Name _____

This card makes me feel...

because...

Name _____

This card makes me feel...

because...

Name _____

Gallery Walk Exit Card

Name: _____ Date: _____

What is one thing you taught someone else during your Gallery Walk?

What is one thing you learned during your Gallery Walk?

What Issue did you find to be most interesting or meaningful to you?

Begin to think about how the content in the cards relates to you, your friends, or your family... and start to imagine some innovative solutions!

Gallery Walk Exit Card

Name: _____ Date: _____

What is one thing you taught someone else during your Gallery Walk?

What is one thing you learned during your Gallery Walk?

What Issue did you find to be most interesting or meaningful to you?

Begin to think about how the content in the cards relates to you, your friends, or your family... and start to imagine some innovative solutions!

ACTIVITY Waste Journal

Name: _____ Start Date: _____ End Date: _____

Item thrown out	Location of Disposal (School/Home/Street)	Which bin did you put it in? (Blue/Green/Brown/Black)	How long did you have this item before throwing it out? (Hours/days/weeks/longer)

Name: _____ Start Date: _____ End Date: _____

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For more resources and downloadable Green Team materials, check out the Recycling Champions website
www.grownyc.org/RCP

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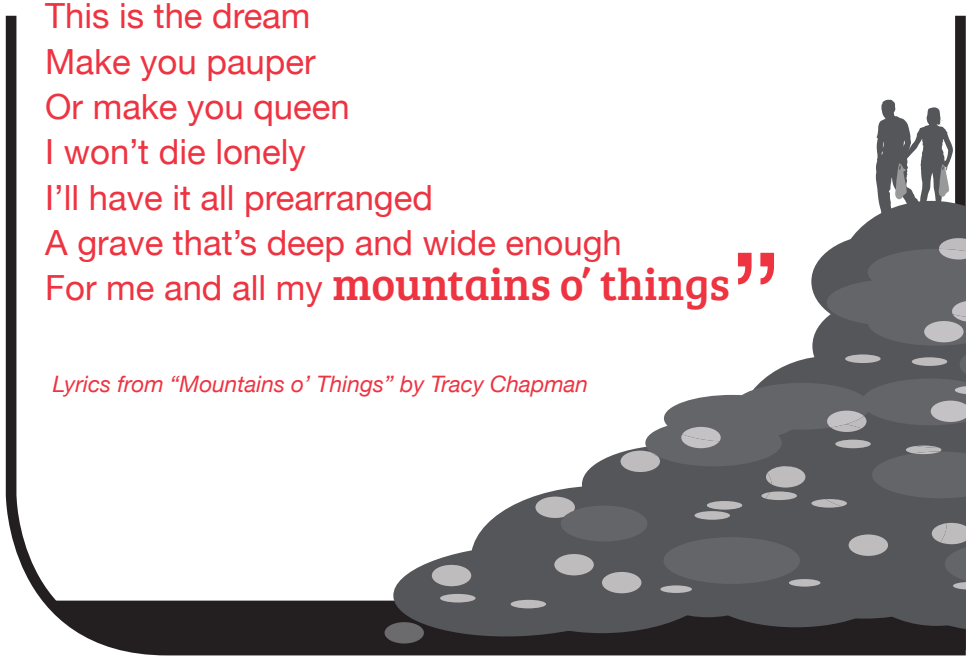
"**Consume** more than you need
This is the dream
Make you pauper
Or make you queen
I won't die lonely
I'll have it all prearranged
A grave that's deep and wide enough
For me and all my **mountains o' things**"

Lyrics from "Mountains o' Things" by Tracy Chapman



1

Planned obsolescence (n.)

A method of stimulating consumer demand by designing products that wear out or become outdated after limited use.

http://www.dictionary.com/browse/planned-obsolescence

1

12 average number of minutes a plastic bag is used before being thrown away

1,000,000,000,000 number of plastic bags used globally each year

1,000 minimum number of years before a plastic bag decomposes

http://www.earth-policy.org/plan_b_updates/2014/update123

1

"Before [World War II], **plastic played a very limited role in material life**. After the war, [surplus] oil became the driving force behind the American economy, and plastics, which are **made from petroleum**, became **ubiquitous**, used in everything from dry cleaning bags and disposable pens to Styrofoam and shrink-wrap. An array of **disposable products** from plastic silverware to paper cups, meanwhile, **enshrined cleanliness and convenience...**"

Excerpt from Down to Earth: Nature's Role in American History by Ted Steinberg

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"I am convinced that if we are to get on the right side of the world revolution, we as a nation must undergo a radical revolution of values. We must rapidly begin the **shift from a 'thing-oriented' society to a 'person-oriented' society**.

When machines and computers, profit motives, and property rights are considered more important than people, the giant triplets of **racism**, **materialism**, and **militarism** are incapable of being conquered..."

Excerpt from Dr. Martin Luther King, Jr.'s "A Revolution of Values"

http://zinnedproject.org/wp-content/uploads/2009/10/21king_revolution.pdf

1

"Men and women are sacrificed to the **idols of profit and consumption**: it is the '**culture of waste**' ….Yet these things become the norm: that some homeless people die of cold on the streets is not news. In contrast, a ten point drop on the stock markets of some cities is a tragedy. [...] Thus people are disposed of, as if they were trash."

Excerpt from Pope Francis's Weekly Address during World Environment Day on June 3, 2015

https://w2.vatican.va/content/francesco/en/audiences/2013/documents/papa-francesco_20130605_udienza-generale.html

1

Eastside Online http://bit.ly/2pT2l5l

1

Popa Matumula, Tanzanian cartoonist
Throw Away Society

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Polyp, a British cartoonist
http://www.polyp.org.uk/cartoons/consumerism/polyp_cartoon_Rat_Race.jpg

This panoramic image, titled "99 Cent," depicts a 99 Cents Only store in Los Angeles. It was taken by German photographer Andreas Gursky in 1999.

Consumerism (n.)

1. The protection or promotion of the interests of consumers.

2. The preoccupation of society with the acquisition of consumer goods.

Oxford English Dictionary

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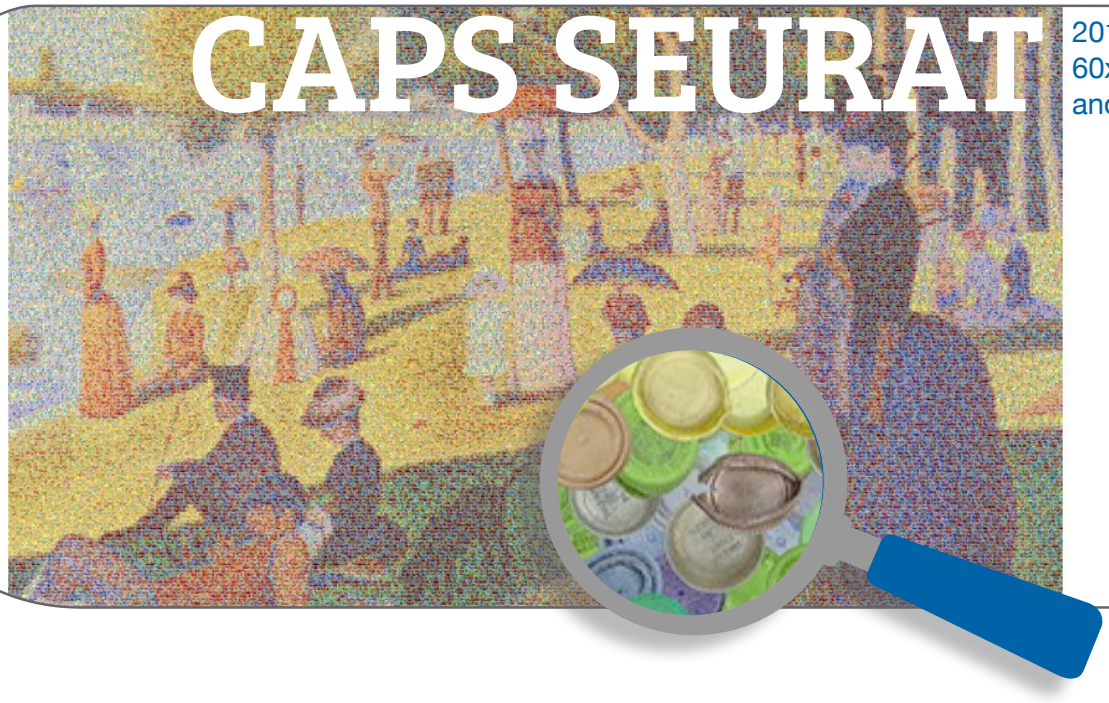
CAPS SEURAT



2011
60x90” in one panel,
and 88x132” in 3 panels

400,000 plastic bottle caps, are depicted in Caps Seurat. That is equal to the average number of plastic bottles consumed in the **United States every minute.**

Chris Jordan, Running the Numbers (2006-Present)
http://www.chrisjordan.com/gallery/rtn/#caps-seurat

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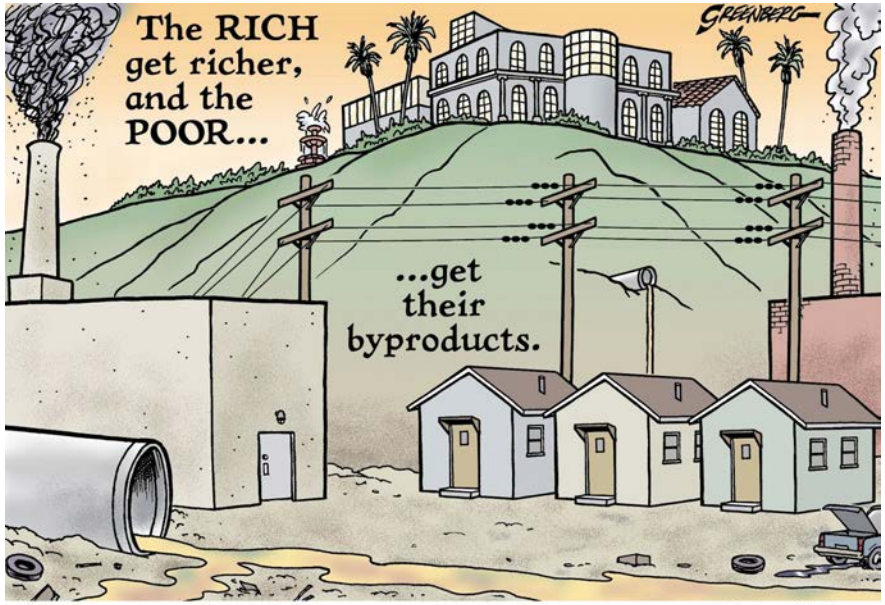

Steve Greenberg, cartoonist April 15, 2010 VCReporter
Title: The poor get...

http://www.greenberg-art.com/.Toons/.Toons,%20Environ/PoorGet.html

"Everyday, garbage trucks needlessly travel thousands of miles throughout New York City polluting our air with diesel fuel, clogging our streets, and diminishing our quality of life. These **impacts are greatest** in those **few low-income and communities of color** where old truck-dependent transfer stations are clustered, and along the truck routes used to haul garbage."

Excerpt from a Testimony to the New York City Council (2/13/15)

http://www.nyc-eja.org/public/newsroom/NYC-EJA_TestimonytoCityCouncil_CapacityReduction_102513.pdf

"On a windy day, fumes and debris can blow into Barretto Point Park from [nearby waste transfer] stations. Private transfer stations are sometimes open to the elements."

http://www.nyenvironmentreport.com/the-bronx-is-breathing/

Environmental justice is the **fair treatment** and **meaningful involvement** of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies. **No group of people should bear the impact** of negative environmental consequences, and all people should have the **opportunity to participate** in decisions about things that may affect their environment and health.

Definition from the United States Environmental Protection Agency

https://www.epa.gov/environmentaljustice

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Every day, nearly **6,000 tons** of trash are hauled in and out of the South Bronx, requiring about 1,400 diesel truck trips. This means **two to three truck trips every minute** over a typical eight to ten hour day.

http://www.nyenvironmentreport.com/the-bronx-is-breathing/

Fishermen have to navigate plastic debris to catch the seafood they hope to sell.

http://creofire.com/wp-content/uploads/2014/06/url12.jpg

Protesters lying in front of dump trucks taking soil contaminated with PCB to the landfill.

In 1973, the Ward Transformers Company dumped 31,000 gallons of polychlorinated biphenyl (PCB) on the side of roadways in 14 North Carolina counties. NC devised a plan to build a **landfill** to deposit the **contaminated soil**.

The site of the landfill was Shocco, a rural town in Warren County that was **75% African American**, with neither a mayor nor a city council. Warren County had the highest majority of African Americans and out of North Carolina's 100 counties, it was ranked **97th in GDP**.

Residents feared that their **groundwater would be contaminated** by PCB, so **local leaders organized protests** against the construction of the landfill which attracted the support of civil rights groups nationwide.

https://sites.duke.edu/docst110s_01_s2011_sb211/what-is-environmental-justice/history/

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“A 2009 NYU-Wagner study reported that ‘**rates of death from asthma** are about **three times higher in the Bronx** than the national average. Hospitalization rates are about five times higher.’”

http://www.nyenvironmentreport.com/the-bronx-is-breathing/

Neighborhood residents playing basketball at a court located near the Shell Oil Refinery in Norco, Louisiana.

©Mark Ludak

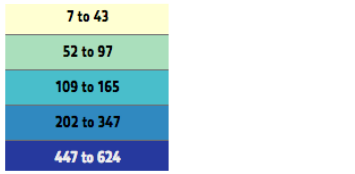
http://www.mhhe.com/socscience/anthropology/image-bank/kottak/chap14/kot37055_1409ta.jpg

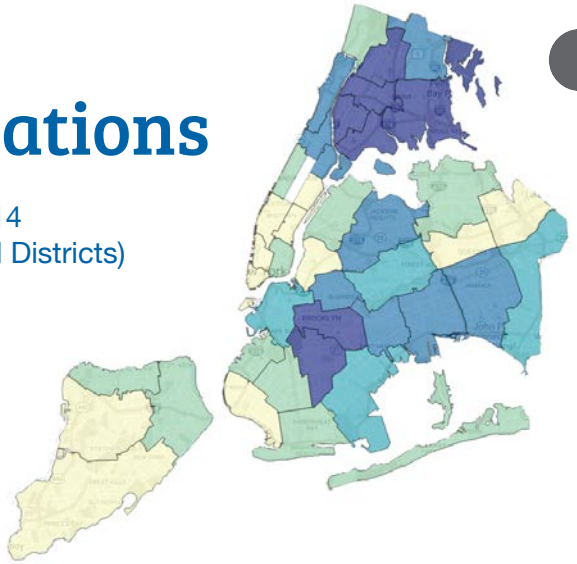
The orange lines on this map are train cars loaded with NYC’s waste headed to out-of-state landfills, blocking access to the waterfront and contributing to noise and air pollution.

Source: Google Maps screen capture 5/17/17

Asthma Hospitalizations

Age Group: 0 to 14 years;
UHF District; Number; 2014
(2010, United Health Fund Districts)





Source: Citizens’ Committee for Children of New York (2013)

New York State Statewide Planning and Research Cooperative System (SPARCS) Deidentified Hospital Discharge Data, retrieved from New York City Department of Health and Mental Hygiene NYC Tracking Program: Environment and Health Data Portal. [Asthma Hospitalizations (Children under 15); 2000-2014]. http://a816-dohbesp.nyc.gov/IndicatorPublic/

http://data.cccnewyork.org/data/map/7/asthma-hospitalizations#7/197/4/11/20/a
http://www.cccnewyork.org/blog/concentrations-of-risk-asthma-and-poor-housing-conditions/

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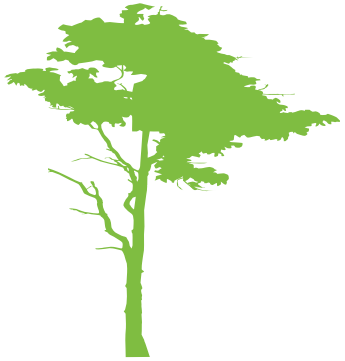
“Only when the **last tree** has been cut down, the last fish been caught, and the last stream poisoned, will we realize we cannot eat money.”



Cree Indian Prophecy

The timber industry deforests land and replaces it with a mono-culture tree farm, meaning all trees are the same type and same age. This patchwork forest is near Clatsop County, Oregon. This pattern of land use displaces and diminishes native flora and fauna, and releases greenhouse gases.

https://en.wikipedia.org/wiki/Clearcutting
Lewis and Clark River 2148s.JPG

Amount of oil
needed to make
1 plastic bottle

http://bit.ly/2qz0Bx0

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Non-renewable resource (n.)

A resource that **does not renew itself** at a rate fast enough for human extraction (i.e., millennia and millions of years vs. years or decades).

Examples include **minerals** and **metal ores, fossil fuels (coal, petroleum, natural gas)** and **groundwater** in certain aquifers.

https://en.wikipedia.org/wiki/Non-renewable_resource

Aerial view of strip mine with heavy machinery - Stuart Hall - Photographer's Choice - Getty Images.

"I see a lot of **damage to Mother Earth**.

I see water being taken from creeks where **water belongs to animals, not to oil companies.**"

Winona LaDuke, an environmentalist, activist, and member of the Ojibwe nation

http://www.theworldcounts.com/counters/shocking_environmental_facts_and_statistics/resources_extracted_from_earth

"Fracking" by Kap (2013)

https://www.caglecartoons.com/viewimage.asp?ID={1A1B8453-1909-4BC4-B360-86F950D1D4F5}

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"Running on Empty" by David Horsey (2011)

http://www.sfgate.com/news/article/Running-on-empty-2383756.php

"Every year there are more people on the planet, and every year more of them move to cities. Since 1950, the **world's urban population has ballooned** to over 3.9 billion from 746 million.

"To build those cities, people are pulling untold amounts of sand out of the ground. Usable sand is a **finite resource**. Desert sand, shaped more by wind than by water, generally doesn't work for construction. To get the sand we need, we are **stripping** riverbeds, floodplains and beaches."

https://www.nytimes.com/2016/06/23/opinion/the-worlds-disappearing-sand.html

"Like that famous ship [the Titanic], [society's] infrastructure is powered by **brutish** and **artificial** sources of energy that are **environmentally depleting**. It pours waste into the water and smoke into the sky. It attempts to work by its own rules, which are **contrary to those of nature**. And although, it may seem invincible, the fundamental **flaws in its design** presage tragedy and disaster."

Excerpt from "Cradle to Cradle" by William McDonough & Michael Braungart

Natural resource extraction

is the set of activities that involve removing materials from the environment.

Logging is one example of resource extraction. If not done in a sustainable manner, logging extracts trees and their removal causes other changes that can result in soil and nutrient removal from the logged area. Even if it is accomplished sustainably, logging changes an environment.

Definition from Encyclopedia.com

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The fossil fuel industry has grown over the past decade by combining horizontal drilling and **fracking** to **extract oil & gas** from shale and other underground rock formations.

Fracking injects large quantities of water, sand and toxic chemicals under high pressure to release oil and gas that are tightly held in rock layers.

The fracking boom and low-priced natural gas have **spawned a resurgence in plastics manufacturing** — and the **pollution** that comes with it. Transforming ethane into plastics and other products is inherently **toxic**, polluting the environment and imposing **public health risks** on petrochemical workers and the communities near the plants.

Alberta Tar Sands (Canada)

Tar sands are a mixture of mostly sand, clay, water, and a thick, molasses-like substance called **bitumen**. Bitumen is made of **hydrocarbons**—the same molecules in liquid oil—and is used to produce gasoline and other petroleum products. **Extracting bitumen from tar sands, and refining it into products like gasoline, is significantly costlier and more difficult than extracting and refining liquid oil.**

https://www.foodandwaterwatch.org/sites/default/files/ib_1702_fracking-plastic-web.pdf

By Howl Arts Collective (Flickr: tar sands, Alberta) [CC BY 2.0 (http://creativecommons.org/licenses/by/2.0)], via Wikimedia Commons

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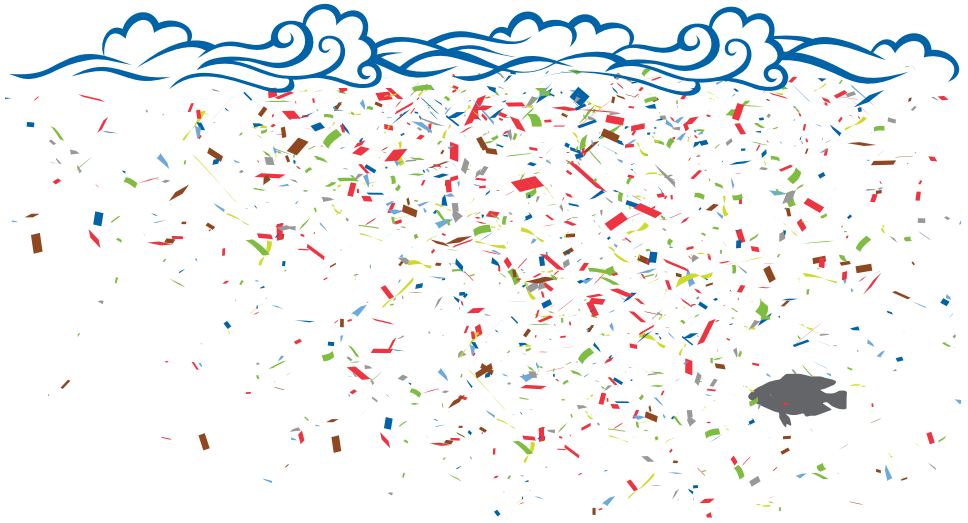
“There is **no such thing as ‘away.’**

When we throw anything away it must go somewhere.”

Annie Leonard, The Story of Stuff

By 2050, there will be **more plastic** in the ocean **than fish**, by weight.



https://www.weforum.org/agenda/2017/01/more-plastic-in-sea-than-fish-3-strategies/

Chris Jones
5 Gyres FAQ #1: What is a gyre?
World Map courtesy of Wikimedia Commons (commons.wikimedia.org)

https://vimeo.com/154149905

Ocean Dumping Ban Act of 1988

In the past, communities around the world **used the ocean for waste disposal**, including the disposal of chemical and industrial wastes, radioactive wastes, trash, munitions, sewage sludge, and contaminated dredged material.

https://definitions.uslegal.com/o/ocean-dumping-ban-act-of-1988/

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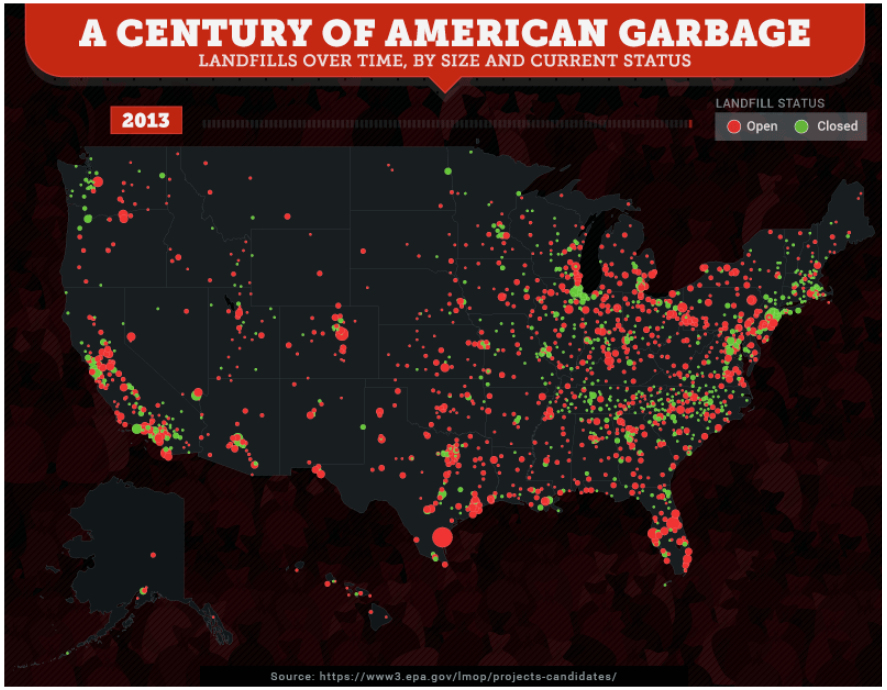
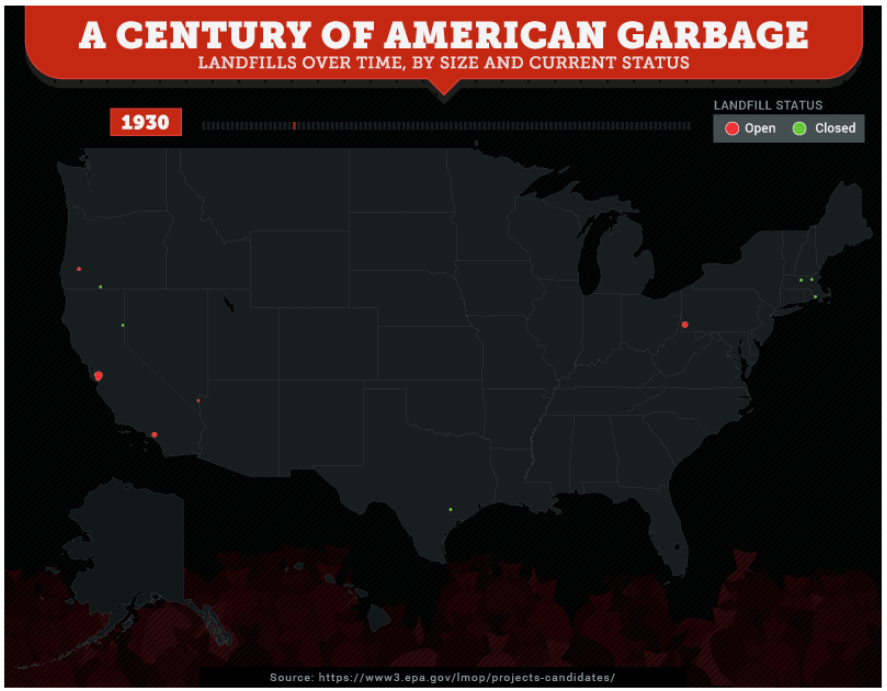


https://www.saveonenergy.com/land-of-waste/



https://www.saveonenergy.com/land-of-waste/

40% of food in the United States goes uneaten.

Most of that food goes to landfills.

https://www.nrdc.org/sites/default/files/wasted-food-IP.pdf

https://www.linkedin.com/pulse/zero-waste-want-matthew-s-hollis

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https://vimeo.com/195856946

Chris Jordan, Midway Atoll Refuge
http://www.chrisjordan.com/gallery/midway/#CF000313%2018x24

Throw away (phrasal verb)

1. To get rid of something that you no longer want
2. To waste something such as an opportunity or an advantage

http://www.macmillandictionary.com/us/dictionary/american/throw-away

Waste disposal (n.)

Removing or destroying or storing damaged, used or other unwanted domestic, agricultural or industrial products and substances.

Disposal includes burning, burial at landfill sites or at sea, and recycling.

http://www.thefreedictionary.com/waste+disposal

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“‘It’s important to understand that ‘waste-to-energy’ is not an accurate term,’ says Mike Ewall, [a veteran environmental justice advocate in the Chester, PA area]. **‘Incinerators are still incinerators** even if they **produce electricity**.’

“The argument is over whether ‘waste-to-energy’ plants adequately **capture** enough of the **pollutants** that are produced by trash-burning, or **continue to release dangerous toxins** into the air the same way old-fashioned incinerators did.”

CityLimits.org, “LIfe Near a Landfill” by Jarrett Murphy

https://citylimits.org/2015/05/22/life-near-a-landfill-the-towns-and-people-who-end-up-with-nycs-trash/

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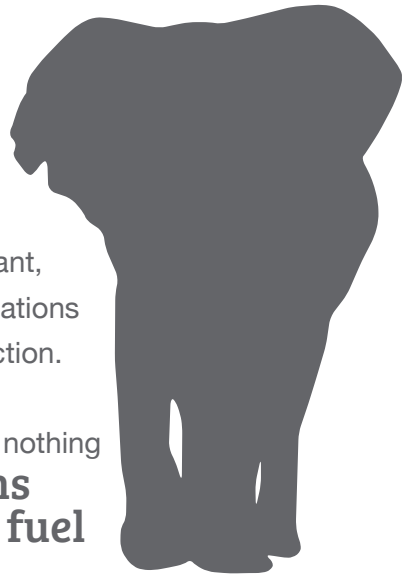

“Most likely, you think we hated the elephant, the golden toad, the thylacine and all variations of whale harpooned or hacked into extinction.

It must seem like we sought to leave you nothing but benzene, mercury, **the stomachs of seagulls rippled with jet fuel and plastic.**”

Excerpt from “Letter to Someone Living Fifty Years from Now” by Matthew Olzman
https://www.poets.org/poetsorg/poem/letter-someone-living-fifty-years-now

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"In 1895, **sanitary conditions had become intolerable**. Horses were leaving an estimated **2.5 million pounds of manure** and **60,000 gallons of urine** on the streets every day.

Horse carcasses rotted in the streets. Garbage piles reached a foot or two deep, cleared only haphazardly by "ragtag army of the unemployed."

https://en.wikipedia.org/wiki/George_E._Waring,_Jr.

In 1987, the **Mobro 4000** (also known as the **"Gar-Barge"**) traveled from **New York City to Belize and back** trying to find a place to dump its waste.

http://www.nytimes.com/2013/05/06/booming/new-video-series-re-examines-garbage-barge-fiasco.html

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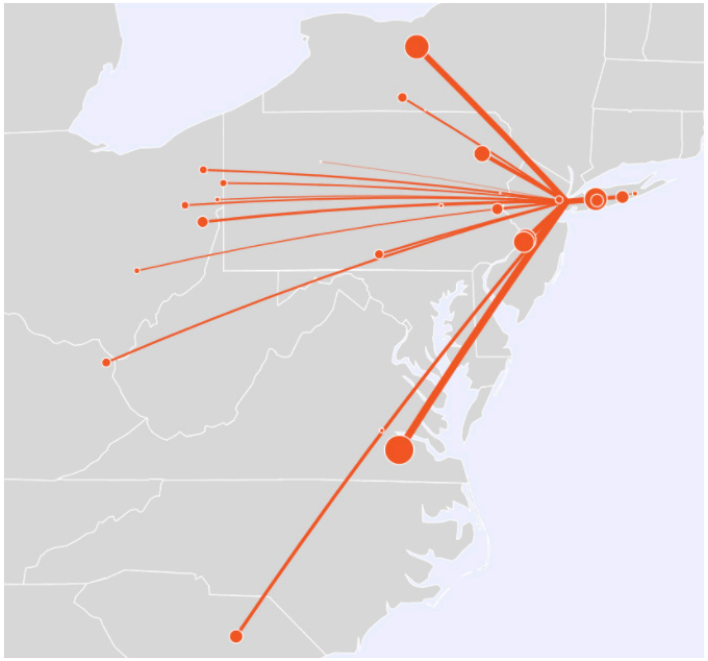
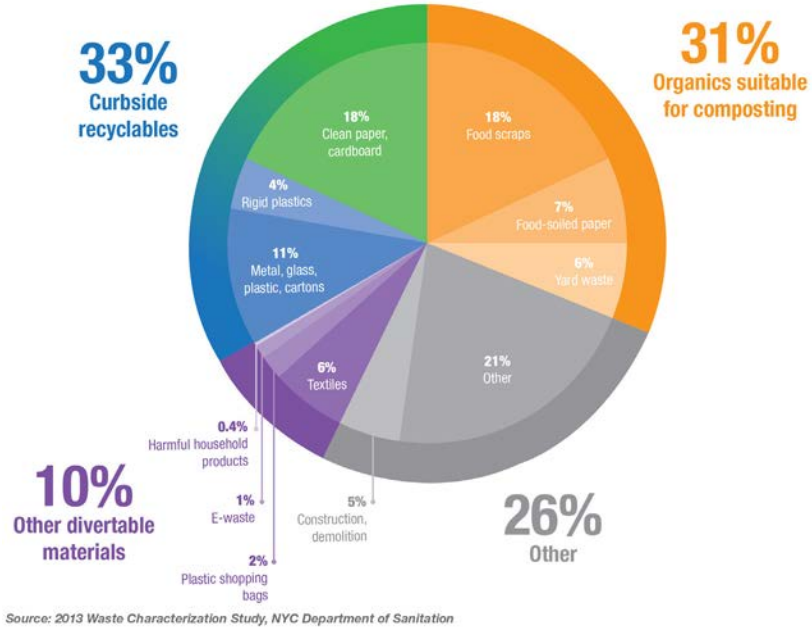


Landfills where New York City sends its waste
http://journeys.gettingtozero.nyc/curb-to-landfill

http://www.ibo.nyc.ny.us/iboreports/waste-export-costs-to-rise-as-remaining-marine-transfer-stations-open-march-2017.pdf



https://www1.nyc.gov/assets/dsny/downloads/pdf/studies-and-reports/OrganicsCollection-LL77-NYCOrganicsCollectionReport-2015.pdf

Incinerators where New York City sends its waste
http://journeys.gettingtozero.nyc/incineration

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16%

diversion rate* in 2016

100%

diversion rate* goal by 2030

*diversion rate (n.)

the percentage of waste diverted from traditional disposal (i.e., landfilling, incineration) to be recycled, composted, or re-used

https://www1.nyc.gov/assets/dsny/docs/about_dsny-non-dsny-collections-FY2016.pdf

New York City's recycling law-- which provided residents with curbside collection of recyclables -- took effect on **July 14, 1989**.

Voluntary recycling collections, which had already begun in some neighborhoods, were now becoming mandatory citywide.

https://www.nrdc.org/experts/eric-goldstein/new-york-citys-history-making-recycling-law-turns-25-years-old-part-i

Food waste is a major environmental and social problem in the United States, and in New York City, food waste leads to unsightly streets, smelly sidewalks, and large rat populations.

https://www.flickr.com/photos/39908901@N06/7559458802

Street litter ultimately ends up in our waterways, as seen in this image of the Bronx River

https://www.riverkeeper.org/news-events/news/water-quality/exploring-polluted-nyc-waterways-decide-im-going-can/

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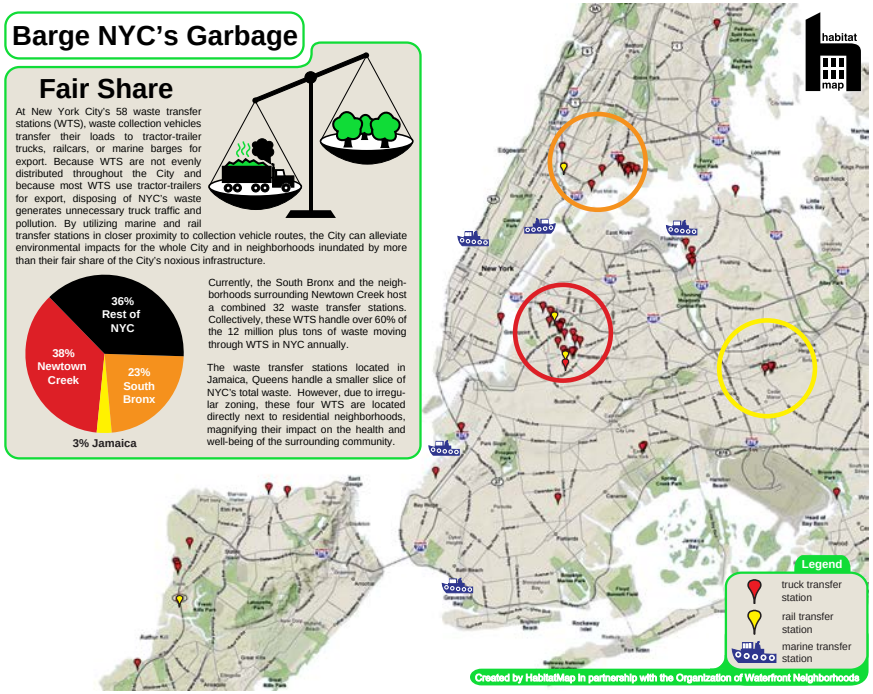
“Pizza Rat” might have been a funny viral video, but rats are a serious problem in New York City. They nest 100 feet from a food source, and **with piles of trash all over the city’s aging infrastructure**, it is a perfect rat habitat. Rats cause structural damage and carry diseases that can be fatal to humans.

Facts: Rat Academy, NYC Department of Health
http://images.hellogiggles.com/uploads/2015/10/07/pizza-rat.jpg



http://www.habitatmap.org/habitatmap_docs/BargeNYC’sGarbage_FairShare.pdf

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