Air Pollution & Quality of Life in East Flatbush, Brooklyn.

A National Science Foundation Graduate K-12 (NSF-GK12) Program, in partnership with It Takes A Village Academy and Brooklyn College.
Air Quality & The Olympics

• The International Olympic Committee (IOC) stated that "Beijing Air Quality Could Put Athletes at Risk".

• International athletes wore gas masks in Beijing, delayed traveling to China, and some athletes even chose not to compete.

• In order to improve air quality, Beijing removed 90% of the cars from the road and closed hundreds of factories and power plants before and during the Olympics.
Good and Bad Air Quality Days in Beijing
Air Quality in the News and Media

- **Forecast**: Sunny, hot, air quality alert
  *Knoxville News Sentinel, TN*
- **Code red air quality today!**
  *Richmond Times Dispatch, VA*
- **Steps taken to improve air quality at high school**
  *ABC15.com (KNXV-TV), AZ*
- **Report Warns Poor Air Quality Killing Canadians**
  *MarketWatch - Aug 13, 2008*
- **Air Pollution Bad in Beijing, Not Great in NY**
  *State ReadMedia (press release), NY - Aug 4, 2008*
What is air made of?

- Nitrogen: 78.0842%
- Oxygen: 20.9463%
- water vapor: 1%
- Argon: 0.9342%
- Carbon dioxide: 0.0384%
- Other: 0.002%
So what is Air Pollution?

- **Air pollution** is any chemical, physical, or biological matter that changes the atmosphere in such a way as to cause harm to the environment.

- **Examples:**
  - **Carbon Dioxide** - believed to be a major contributing agent to global warming.
  - **Asbestos** - inhaling asbestos fibers can cause serious illnesses, including mesothelioma and asbestosis.
  - **Mold** - molds and other types of fungus release spores into the air and can trigger asthma episodes.
Illnesses linked to air pollution.

- **Minor Lung Illnesses** - sore throat, coughing, sneezing, also watery itchy eyes.
- **Lung Infections** - croup, bronchitis, and pneumonia.
- **Asthma** - causes shortness of breath, coughing or wheezing or whistling in the chest.
- **Chronic Obstructive Pulmonary Disease (COPD)** - encompasses two major disorders: emphysema and chronic bronchitis.
- **Lung Cancer** - most common cause of death due to cancer.
- **Coronary Artery Disease** - refers to the blocking of the blood vessels that supply blood to the heart.
People at risk in Brooklyn.

People at risk from poor air quality in Brooklyn*:

**Pediatric Asthma**: 60,806  
**Adult Asthma**: 156,821  
**Chronic Bronchitis**: 78,575  
**Emphysema**: 33,462  
**Cardiovascular Disease**: 615,491  
**Diabetes**: 141,024

That is over 1 *million* people who are at risk of poor health every single day due to pollution in Brooklyn (about 43% of the population).

* source: American Lung Association - 2008 State of the Air Report
What causes air pollution?

• Some pollution comes from natural sources, but most is the result of human activity.
• The biggest causes are fuel-burning power plants and automobiles.
• Combined, they are responsible for about 90% of all air pollution in the United States.
What causes air pollution?

In China a lot of pollution comes from coal burning plants. To the right is a 2007 satellite shot.
Most cities only measure Ozone and TPS (total particulates suspended). Some include Sulfur Dioxide, Nitrogen Dioxide and Carbon Monoxide. Very few test VOC's, Lead or Mercury.
### Your Local Air Quality

For Brooklyn, NY 11212

#### Alert
Weather Alert for Your Area!
Check our Local Alerts Section for details

#### Today's Air Quality - Jersey City, NJ

<table>
<thead>
<tr>
<th>Date</th>
<th>Code</th>
<th>AQI Level</th>
<th>Major Pollutant</th>
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<td>Ozone</td>
</tr>
<tr>
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#### Air Quality Forecast - Jersey City, NJ

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<tbody>
<tr>
<td>9/4/2008</td>
<td></td>
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</tr>
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<td></td>
<td>105</td>
<td>Ozone</td>
</tr>
<tr>
<td>9/4/2008</td>
<td></td>
<td>75</td>
<td>Small Particulate Matter</td>
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<tr>
<td>9/5/2008</td>
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<td>105</td>
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</tr>
<tr>
<td>9/5/2008</td>
<td></td>
<td>75</td>
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No health impacts are expected when air quality is in this range.
What is Environmental Stewardship?

• Taking responsibility for the environment that you live in and the quality of life that you get as a result.
• If you live in East Flatbush, and you don't care about the quality of the air here, do you think anyone else should care?
• Community's have taken action before to solve their environmental problems.
What we would like to find out:

– How many people are at increased risk of sickness and death because of air pollution in East Flatbush?
– Where does most of the pollution in East Flatbush come from?
– Are there pollution "hot-spots" in East Flatbush?
– What kind of experiments could we as a class perform, to help gage the quality of air in East Flatbush?
– What can we do to improve the quality of air in East Flatbush
How we can get started

Divide into groups and research the following:

– Ozone
– TPS
– Carbon Monoxide
– Nitrogen Dioxide
– Sulfur Dioxide
– Carbon Dioxide

For each kind of pollutant research **source** (where it comes from), **measurement** (how it can be measured in the air) and **effect** (what it does to the environment, including people).