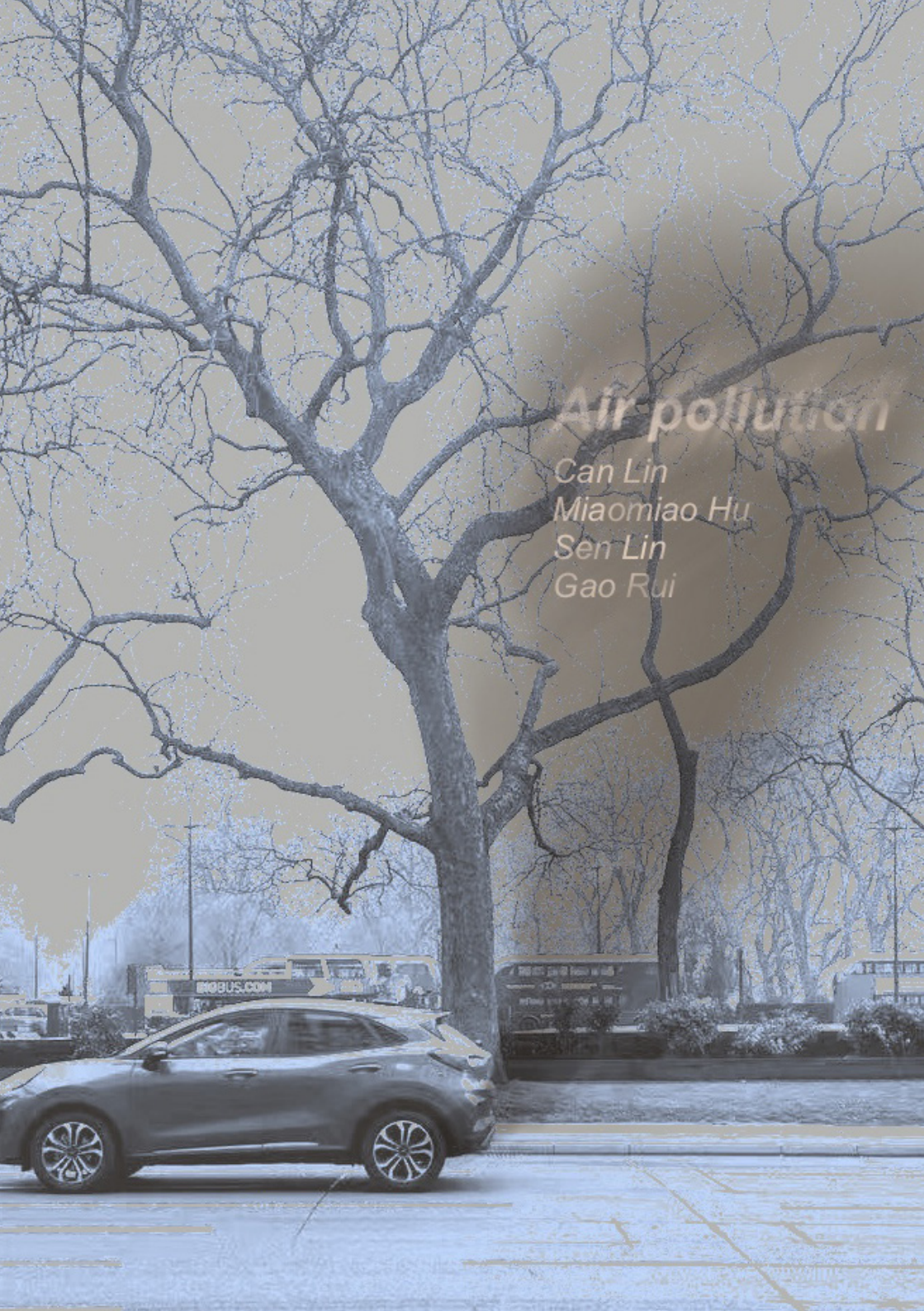


Air pollution

Can Lin
Miaomiao Hu
Sen Lin
Gao Rui


02\03\2025
23:40
GREENWICH
PARK
VERY HIGH
AIR
DEMAND ACTION

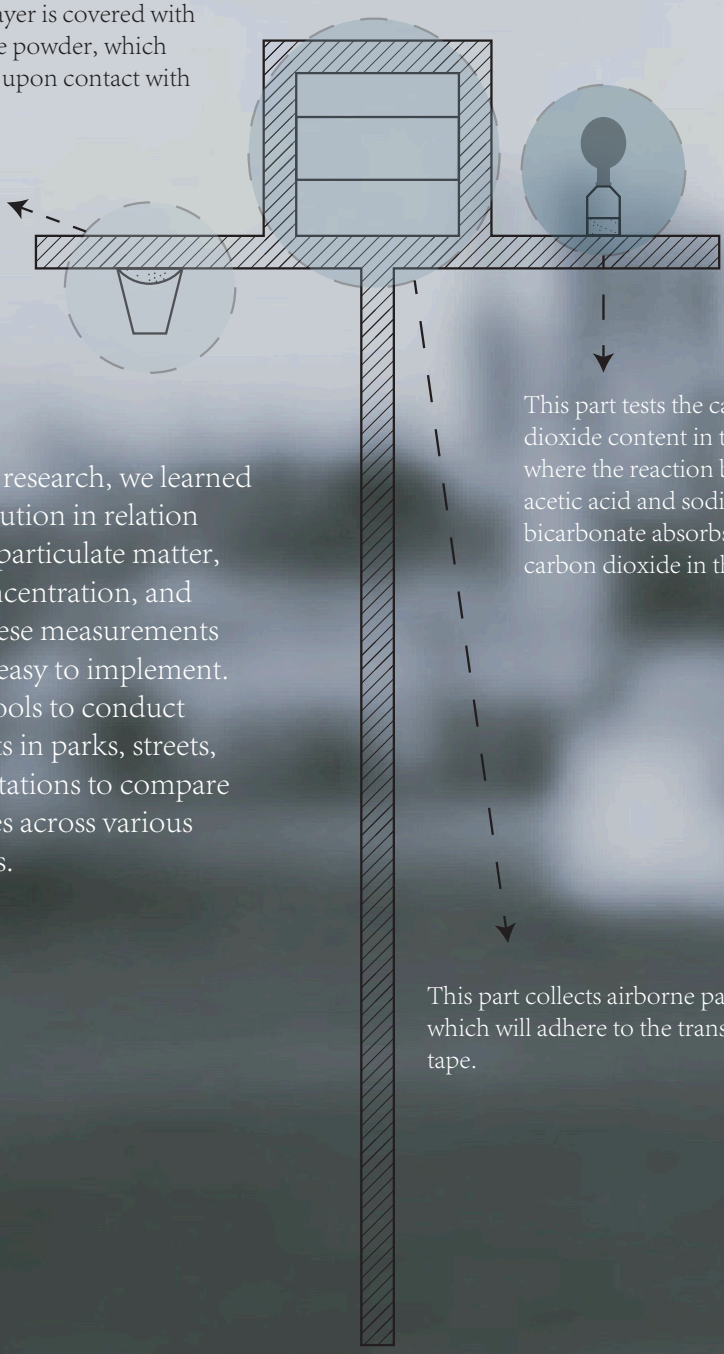
02\03\2025
23:40

GREENWICH PARK

LOW

Parks are often regarded as "pollution sanctuaries," but as air pollution intensifies, we are finding that they are losing this role. When using different real-time air quality monitoring websites to measure the air quality in Greenwich Park at the same time and location, we obtained drastically different results. This has led us

This part collects moisture from the air. The upper layer is covered with calcium chloride powder, which turns into water upon contact with air.



This part tests the carbon dioxide content in the air, where the reaction between acetic acid and sodium bicarbonate absorbs the carbon dioxide in the air.

Through our research, we learned about air pollution in relation to humidity, particulate matter, and CO2 concentration, and found that these measurements are relatively easy to implement. We created tools to conduct measurements in parks, streets, and subway stations to compare the differences across various environments.

This part collects airborne particles, which will adhere to the transparent tape.

PARK

Humidity: High Particulate Matter: Low CO2: Low



STREET

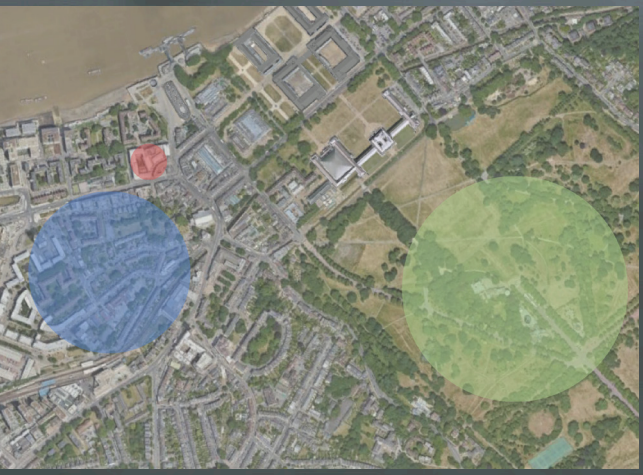
Humidity: High Particulate Matter: Medium CO2: Medium



SUBWAY

Humidity: Low Particulate Matter: High CO2: High





After analyzing and observing the experiment process and results, we concluded that this method cannot accurately measure air quality. Moreover, it still follows traditional measurement approaches. We believe that we should find a more intuitive way to reflect the impact of air quality on humans.

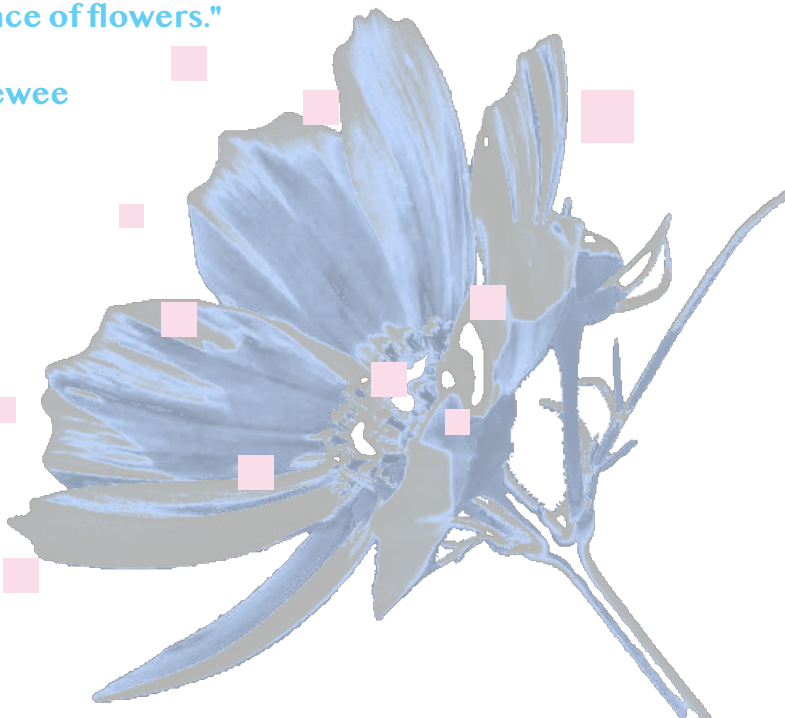
The perception of human body and senses towards air pollution

Based on previous interview videos, two students mentioned that their standard for good air quality is to smell the fragrance of flowers, while for poor air quality it is smoke. Everyone's intuitive perception of air quality is indeed based on their senses.

When it comes to the impact of disgust on the lungs, smoke accumulated from daily breathing or tiny particles in the air will eventually accumulate in the lungs into visible gray black particles, and in severe cases, large areas of gray black will appear.

"I think good air quality is when I feel the air is fresh and can smell the fragrance of flowers."

By Interviewee



Lungs

Flipping lung breathing animation

Air visibility

In addition to smell and lung sensation, vision is also a commonly used sensory indicator for measuring air quality.There is also a very intuitive standard for people's perception of air quality, which is air visibility. The more obstructed the view, the worse the air quality.

1. The horizontal visibility of fog is less than 1 km, and thehorizontal visibility of haze is less than 10 km. 2. Different relativehumidity. The relative humidity of fog is greater than 90%, and therelative humidity of haze is less than 80%. The relative humidity!between 80-90% is a mixture of haze and fog, but its maincomponent is haze. 3. Different thickness. The thickness of fog isonly a few dozen meters to about 200 meters, and the thickness ofhaze can reach about 1-3 kilometers. 4. Different boundary!characteristics. The boundary of fog is very clear, and it may beclear sky after passing the "fog area", but there is no obviousboundary between haze and clear sky area. 5. Different colors.

Generally, when the relative humidity is less than 80%, thedeterioration of visibility caused by the turbidity of the atmosphereand the blurred vision is caused by haze. When the relativehumidity is greater than 90%, the deterioration of visibility causedby the turbidity of the atmosphere and the blurred vision is causedby fog. When the relative humidity is between 80-90%, thedeterioration of visibility caused by the turbidity of the atmosphereand the blurred vision is caused by a mixture of haze and fog, butthe main component is haze. The thickness of haze is relativelythick, reaching about 1-3 kilometers. Since haze is composed ofparticles such as dust, sulfuric acid, and nitric acid, it scatters morelight with longer wavelengths, so haze looks yellow or orange-gray.

There are 6 levels of air quality index:

Grade 1 Excellent (0-50): The air quality index is 0-50, and the air quality is Grade 1 Excellent, represented by green. The air quality is satisfactory, with almost no air pollution, and all types of people can move around normally.

Grade 2 Good (51-100): The air quality index is 51-100, and the air quality is Grade 2 Good, represented by yellow. The air quality is acceptable, but certain pollutants may have a weak impact on the health of abnormally sensitive individuals. It is recommended that a very small number of abnormally sensitive individuals reduce outdoor activities.

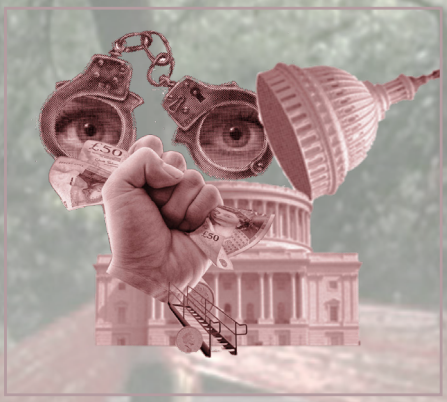
Level 3 mild pollution (101-150): The air quality index is 101-150, and the air quality is level 3 mild pollution, represented by orange. Susceptible individuals may experience mild exacerbation of symptoms, while healthy individuals are more susceptible to irritation symptoms.

Grade 4 moderate pollution (151-200): The air quality index is 151-200, and the air quality is Grade 4 moderate pollution, represented by red. Further exacerbating symptoms in susceptible populations may have an impact on the heart and respiratory systems of healthy individuals.

Grade 5 severe pollution (201-300): The air quality index is 201-300, and the air quality is Grade 5 severe pollution, represented by purple. Patients with heart disease and lung disease have significantly worsened symptoms, reduced exercise tolerance, and symptoms are common in healthy individuals.

Level 6 severe pollution (greater than 300): The air quality index is greater than 300, and the air quality is classified as Level 6 severe pollution, characterized by brownish red color. The air quality is very poor and poses a serious threat to health.

Monetisation of air



The economic cost of air pollution =

Healthcare costs + Property devaluation + Productivity loss + Traffic delays + Government mitigation expenses

**Healthcare Costs **
Air pollution leads to an increase in respiratory diseases, asthma, lung cancer, and cardiovascular diseases, resulting in rising medical expenses.

Property Devaluation
Areas with severe pollution tend to have lower property values compared to areas with cleaner air.

Productivity Loss
Air pollution reduces worker efficiency, increases sick leave, and causes billions in economic losses annually.

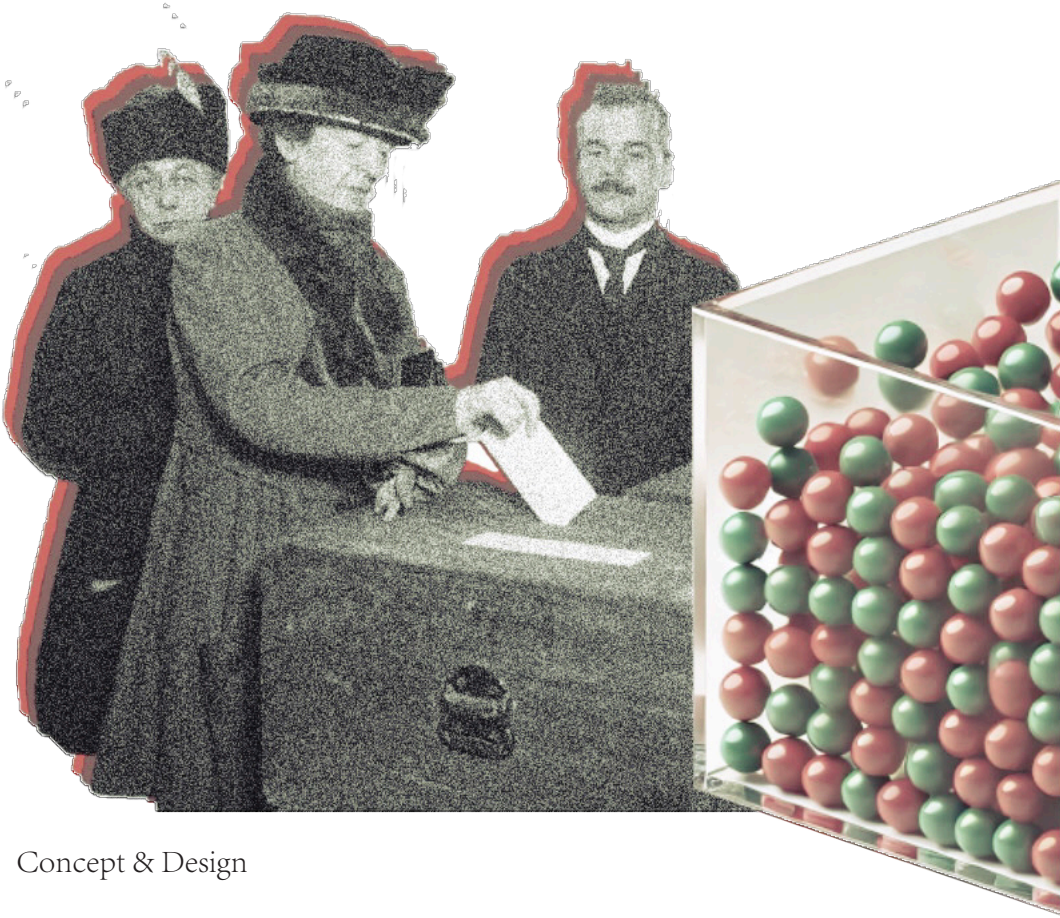
Traffic Congestion
Smog reduces visibility, leading to more traffic accidents, longer commuting times, and disruptions to economic activities.

Government Spending on Pollution Control
Air purification, pollution mitigation projects, and environmental taxes represent significant government expenditures.

Air Rating Scale

AIR TURST VOTING BOX

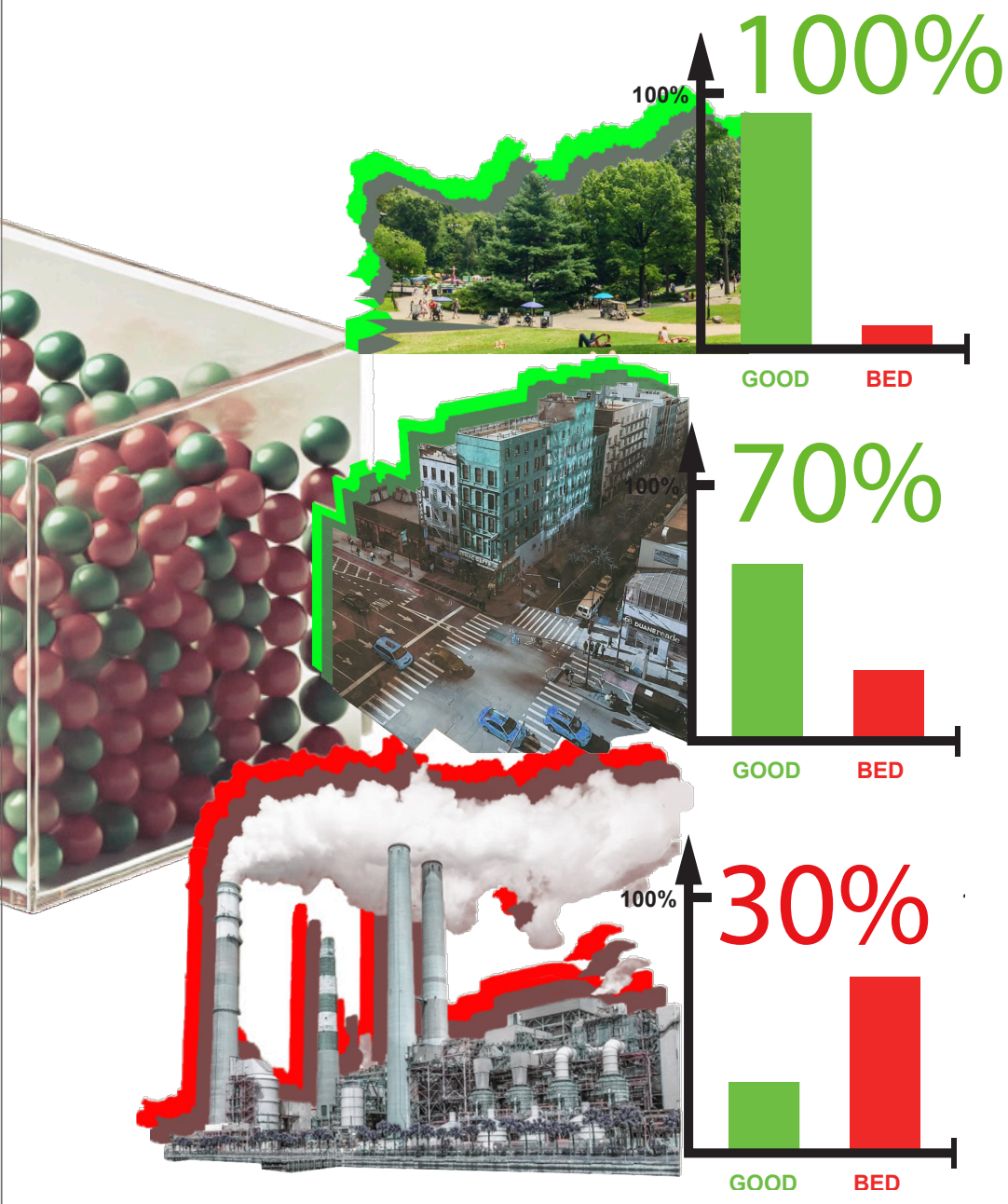
To create an interactive public installation that visualizes the gap between perceived air quality and official air monitoring data.



Concept & Design

Transparent acrylic voting box (symbolizing the irony of "transparency" in air quality reporting).
Two-color voting balls:Green = "Good Air"Red = "Bad Air"
Interaction process:
Passersby cast a vote by dropping a ball into the box based on their air quality perception.
The system calculates and displays the voting proportion (e.g., “70% believe the air is bad”).
Official AQI data is displayed alongside the voting results for comparison.

Test locations:
Parks (low pollution expected)
Streets (moderate pollution)
Subway stations (potential high CO2 levels)



Performances

Air Auction is an interactive performance that simulates a future scenario where air becomes a commodity. Audience members enter an auction market, bidding on air from different regions. The highest bidders get to "enjoy cleaner air," while those who fail to secure a bid are left with "low-quality air."

Real-time bidding list

Hyde Park (London)
AQI 40
↑ £ 57.41/m³

Himalayan glaciers
AQI 25
↑ £ 78.64/m³

Swiss Mountains
AQI 20
↑ £ 93.82/m³

London Lake District
AQI 44
↓ £ 50.02/m³

Seoul Elevated
AQI 58
↓ £ 22.58/m³

processing plant
AQI 52
↓ £ 37.60/m³

Bombay slum
AQI 48
↑ £ 52.05/m³

East London
AQI 46
↓ £ 44.26/m³

Air Auction Rules

1. Participants can bid on air from the same region simultaneously.

2. Participants must wear masks and remain anonymous.

3. Every 10 minutes, a round of bidding is settled. Each region's air goes through a total of three rounds, with the highest bidder winning.

4. If no bids are placed, the air from that region automatically moves to the next round.

5. The starting price is determined based on the Air Quality Index (AQI); the lower the AQI, the higher the starting price.

6. Each bid must increase by a minimum of £ 5/m³, with no upper limit.