Public Lab Deck:

Audience: environmental lawyers

Created for:

2019-09-23
New York State Bar Association:
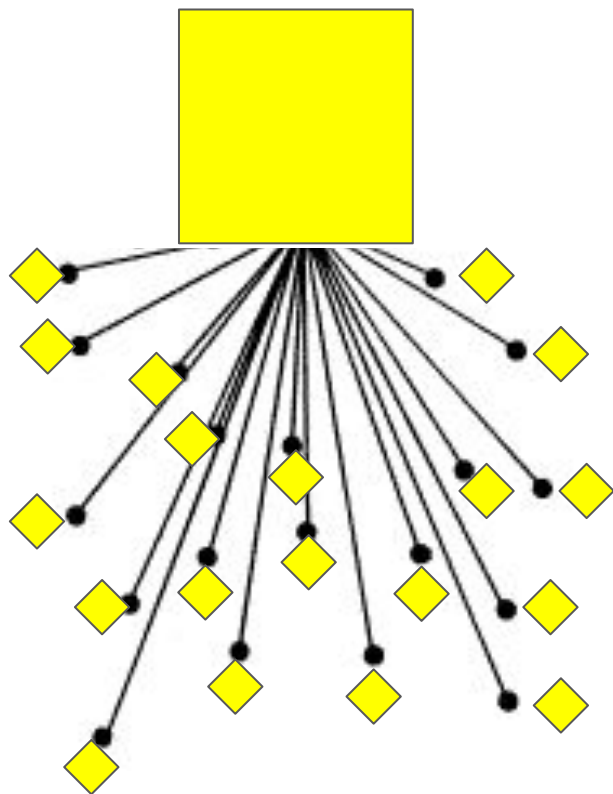Environmental and Energy Law Section Fall Meeting

Community science

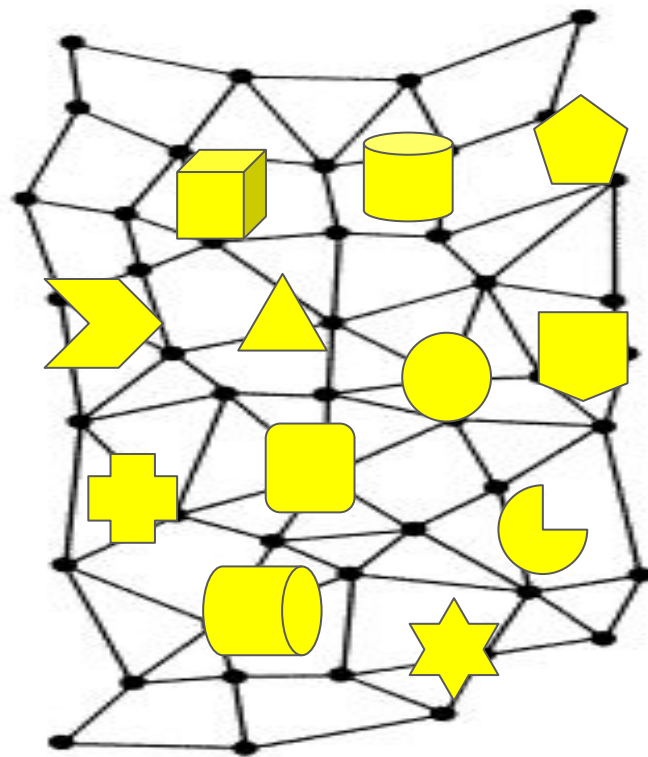Public Laboratory for Open Technology and Science
www.PublicLab.org
@publiclab

Liz Barry
liz@publiclab.org
@lizbarry

September 23, 2019
New York State Bar Association
Environmental & Energy Law Section Fall Mtng

Tarball from Barataria Bay after the BP Oil Disaster, 2010
Courtesy Scott Eustis, wetlands scientist at HealthyGulf.org

Citizen science

Community science

The need for community science:

- **To reduce harm** caused by regulatory gaps
  - Hotspots
- **To reduce harm** caused by regulatory enforcement gaps
  - Monitor placement
- **To reduce harm** caused by gaps in government data
  - Missing data

The need for community science:

- **To Support** empirical observation
  - From anecdote to data
- **To support** data-based decision-making at all levels
  - Overlooked county permitting of industry & infra
- **To Support** environmental journalism
  - Initial coverage of an emerging issue
- **To Support** community organizing
  - Because campaigns take years, stress needs solidarity
  - Exchange stories of pursuit & achievement of justice

Public Lab
is a response
to these needs.

People design & collect data to:

- Go to their neighbors
- Go to representatives
- Go to the press
- Go to agencies
- Go to court

Crowdsourcing & Citizen Science Act

Included in the 2016 reauthorization of
"America Competes Act"
15 USC 3724

citizenscience.gov

Here's how the EPA views citizen science:

Environmental Protection Belongs to the Public: A Vision for Citizen Science at EPA

Community engagement: awareness, partnership, development, stakeholder engagement, public outreach

Case Studies:

Citizen Science in Great Smoky Mountains National Park

Environmental Health Organizing in El Paso, Texas

Condition indicator: media campaign, cross-sector stakeholder involvement, request for further study or involvement by government agency and/or research institutions

Case Studies:

Argentine/Turner Rail Yard Community Air Pollution Monitoring

Southeast Alaska Tribal Toxins Partnership

Management decisions: remediation, restoration, community solution enactment

Case Studies:

Canton Creek Snorkel Survey

Composting Food Waste with Fermentation

Regulatory standard setting: new mandatory and voluntary standards, development of best practices, revision of prior standards, changes in methodologies for measuring compliance status

Case Study:

The Dewey-Humboldt Arizona Garden Project

Community Engagement	Education	Condition Indicator	Research	Management	Regulatory Decisions	Regulatory Standard Setting	Enforcement

Education: Environmental and STEAM literacy, civic participation, stewardship

Case Studies:

Ironbound Community Corporation Partnership

Center in the Park's Senior Environment Corps

Research: creating baseline datasets, identifying trends and hotspots in health and ecological change over time, filling gaps in datasets

Case Studies:

Watershed Monitoring in the Mill (Otter) Creek Watershed

Friends of the Shenandoah River

Regulatory decisions: permits, licenses, leases, environmental permits, zoning and rezoning, site plan approvals, mitigation requirements

Case Study:

Aerial Imagery of the United Bulk Terminals in Plaquemines, Louisiana

Enforcement: launching of inspections; investigations; prosecution of administrative, civil or criminal violations; imposition of new permit conditions; liability

Case Study:

Tonawanda Coke Air Monitoring

Environmental Protection Belongs to the Public: A Vision for Citizen Science at EPA

Types of data collected by community scientists:

- Photographic, audio, or video records
  - timelapse, infrared, thermal, microscopic, or stitched into maps
  - with metadata: timestamps, GPS coordinates
- Colorimetric tests, like litmus paper, or indicator tubes
  - photos show colorimetric changes
- Physical samples of air, water, or soil sent away to certified labs
- Digital sensor readings of many types, in text files or visualizations
- Quantitative data resulting from analysis of qualitative data
  - for example, images of sensor data (particle sizes, for instance)
- Human sensory data, like odor logs or direct visual monitoring
- Health symptoms in animals
- Self-reporting, or medical reporting of human health symptoms

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🏆

Most straightforward image sequence

Edan Rotenberg, Super Law Group,
with the Gowanus Dredgers Boat Club
Gowanus Canal, Brooklyn, NYC, NY

🏆

Best "one & done" image

Scott Eustis, HealthyGulf.org,
United Bulk Petcoke export terminal
Mississippi River, Davant, Louisiana

UNITED BULK TERMINAL

Conveyor

Plume

Additonal Source?

More residual coal under the water in batture

- Photographic, audio, or video records   *"I took this photo"*
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- Photographic, audio, or video records
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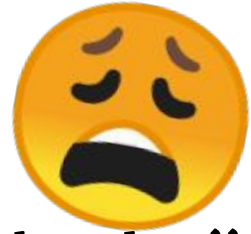- Self-reporting, or medical reporting of human health symptoms

"I took these samples"

For any other type of data:

Someone else has to say
       "I am an expert because X"
       "As an expert, I certify this method Y"

Then, the person who collected the data has to say:
       "I collected this data using method Y"
       "This data means Z"

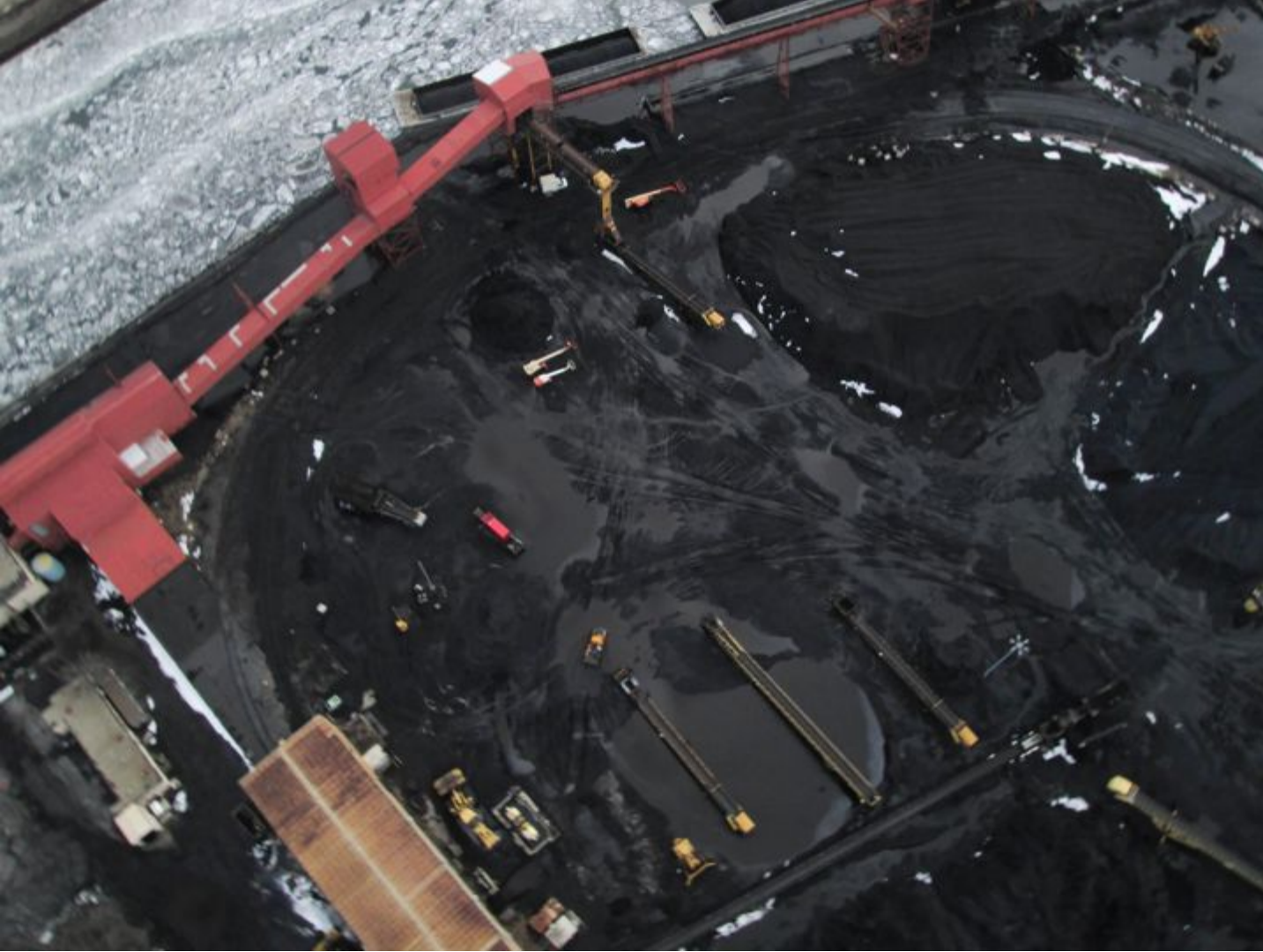Why? Community science develops lower-cost, more affordable methods.

And we show our work.
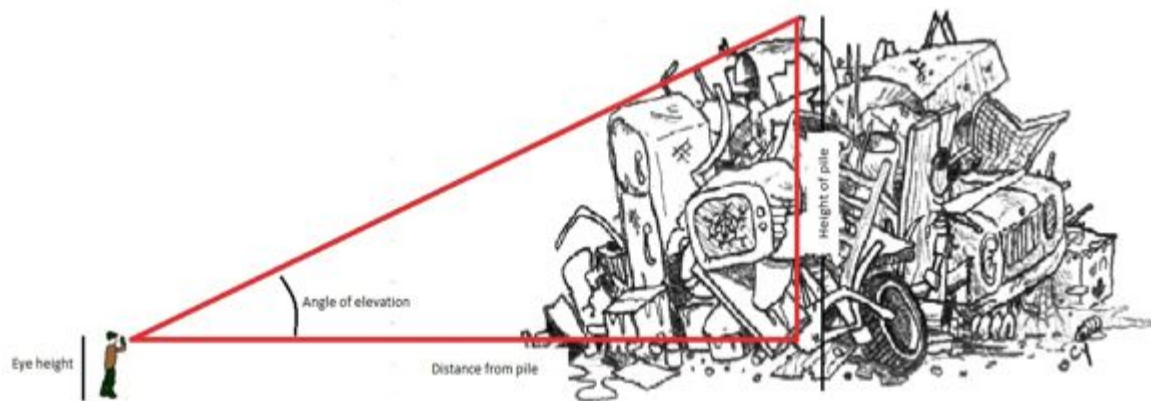
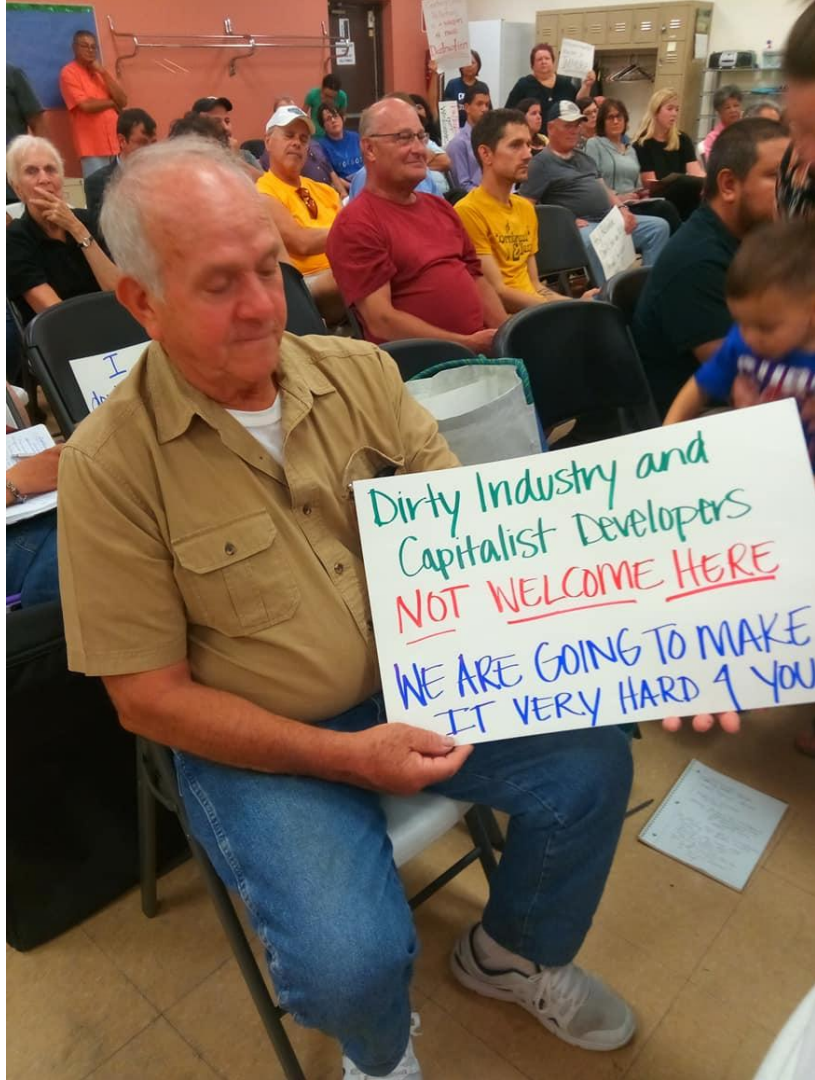# Empirical
Transparent
Open source

Best volume calculation from aerial imagery

Olga Bautista, Southeast Side Coalition
to Ban Petcoke
Calumet River, Chicago, Illinois

2013 Olga Bautista and the South East Coalition to Ban Petcoke map the industrial landscape with balloons and cameras

Eye height

Angle of elevation

Height of pile

Distance from pile

THE UNITED STATES
DEPARTMENT *of* JUSTICE

en ESPAÑOL

JUSTICE NEWS

Department of Justice

Office of Public Affairs

FOR IMMEDIATE RELEASE   Monday, May 11, 2015

Tonawanda Coke to Pay $12 Million in Civil Penalties, Facility Improvements and Environmental Projects to Benefit Tonawanda Community

Under a $12 million settlement with the United States and the state of New York, Tonawanda Coke Corp. will pay $2.75 million in civil penalties, spend approximately $7.9 million to reduce air pollution and enhance air and water quality and spend an additional $1.3 million for environmental projects in the area of Tonawanda, New York. The agreement was announced jointly by Assistant Attorney General John C. Cruden for the Department of Justice's Environment and Natural Resources Division, Regional Administrator Judith A. Enck for the Environmental Protection Agency (EPA), Commissioner Joseph Martens for the New York State Department of Environmental Conservation (NYSDEC) and Attorney General Eric T. Schneiderman for New York.

DOJ collects physical samples under search warrant for use in court **2013-2014**

Scientific results, no enforcement, people protest at facility, media seen by DOJ **2010-2014**

DEC applied to EPA for funding for a 1 year study. 4 high tech air monitors **2009**

Reduce target facilities from 53 to 5, go to NYSDEC, EPA, local uni **2007-8**

Collect air samples in bucket with Global Community Monitor **2004**
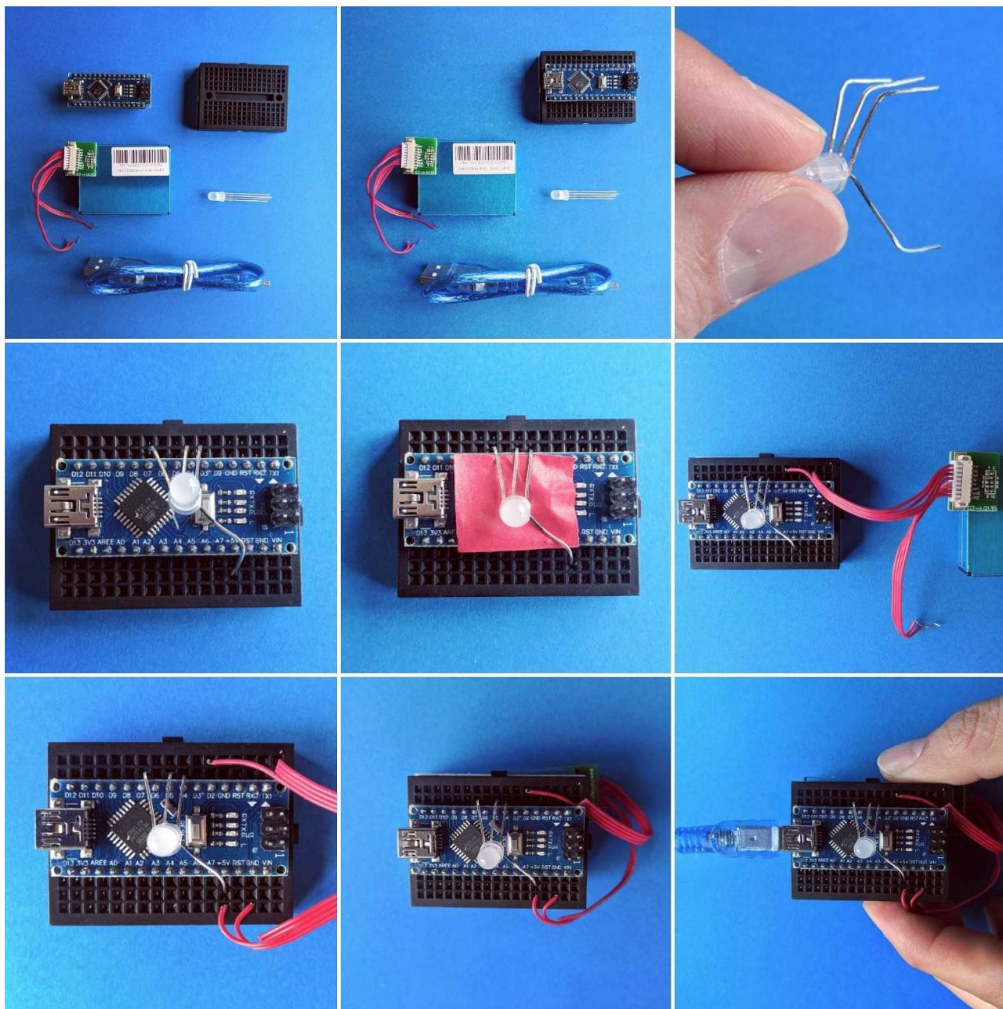
People observed + were affected by health symptoms **2000s**

16 years

A few new/old technologies that are nowhere near being admissible in court...but could they be?
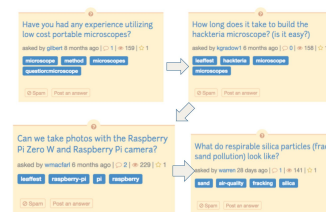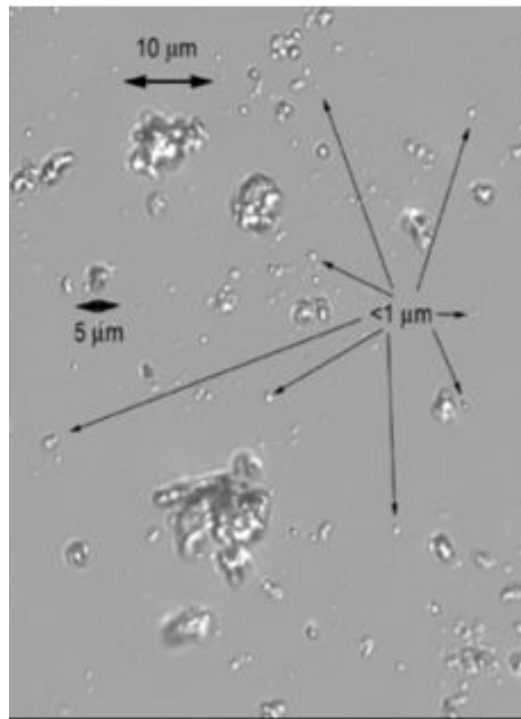
Prototyping, onboarding, testing limits:
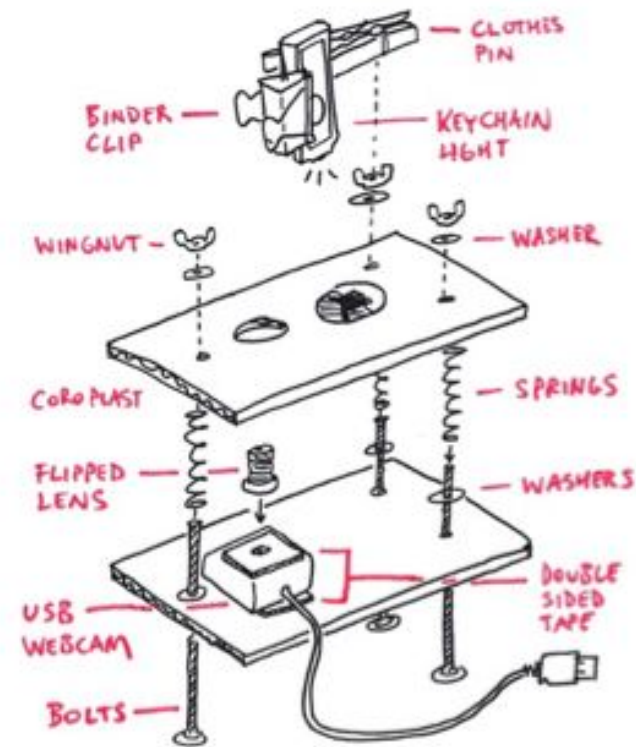
Air sensor swarms

Repurposing consumer tech:

Microscopes
& Sand mining

Have you had any experience utilizing low cost portable microscopes?
asked by gilbert 8 months ago | 🗨 1 | 👁 159 | ⭐ 1
microscope   method   microscopes
questionmicroscope
⊘ Spam   Post an answer

How long does it take to build the hackteria microscope? (is it easy?)
asked by kgradow1 8 months ago | 🗨 0 | 👁 156 | ⭐ 1
leaffest   hackteria   microscope
microscopes
⊘ Spam   Post an answer

Can we take photos with the Raspberry Pi Zero W and Raspberry Pi camera?
asked by wmacfarl 6 months ago | 🗨 2 | 👁 229 | ⭐ 1
leaffest   raspberry-pi   pi   raspberry

What do respirable silica particles (frac sand pollution) look like?
asked by warren 28 days ago | 🗨 1 | 👁 141 | ⭐ 1
sand   air-quality   fracking   silica
⊘ Spam   Post an answer

COMMUNITY Microscope

PublicLab.org/micro

Labels (right diagram):

- CLOTHES PIN
- BINDER CLIP
- KEYCHAIN LIGHT
- WINGNUT
- WASHER
- CORO PLAST
- SPRINGS
- FLIPPED LENS
- WASHERS
- USB WEBCAM
- DOUBLE SIDED TAPE
- BOLTS

Calls to action:

- Work with community scientists to accelerate impact from data
- Join our next open hour on "what counts as evidence?"
- Follow the conversation at
  - publiclab.org/tag/legal
  - publiclab.org/tag/evidence-project
- Engage the Citizen Science Association's Law & Policy WG CitizenScience.org/working-groups/law-policy-working-group/
- …

Broadest community served 1M
- Annual returning visitors to publiclab.org (GoogleAnalytics)

Actives 60K
- Followed on social media (~11K, non-unique)
- Created non-spam publiclab.org account (~45K)
- Subscribed to mailing lists
        (8,300?, 68% of 12234 total)

Total Reach UNKNOWN
- Read media about PL
- Discussed PL
- Attended a PL event

Data Creators 20,000
- *Created map (2800)*
- *Uploaded spectra (13953)*
- *'Grammed on infragram (?)*

Core Contributors 13,000K
- Local organizer (~100?)
- Posted, commented, edited pl.org (4475)
- Wrote code (478)
- purchased open hardware kit (7,497)