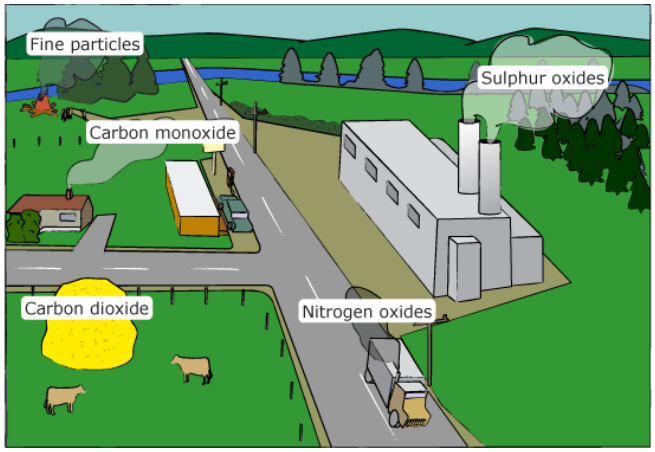
I Breathe What?!



Background:

An air pollutant is a substance in the air that can have adverse effects on humans and the ecosystem. Air pollution comes from many sources and there are different kinds of pollution — some visible, some invisible. Although you can't always see the pollution, it is still being released into the air you breathe through everyday activities like driving and using electricity. Some pollutants even come from natural sources such as lightning, wildfires and livestock.

Materials:

- 10" – 12" cord or string
- Colored beads
  - White - Sulfur Dioxide (SO_2)
  - Purple - Nitrogen Dioxide (NO_2)
  - Pink - Carbon Monoxide (CO)
  - Orange - Lead (Pb)
  - Blue - Volatile Organic Compounds (VOCs)
  - Brown - Particulate Matter (PM_{10} & $PM_{2.5}$)
  - Yellow - Ozone (O3)

Procedure:

Using the colored beads to represent some of the common pollutants that are released into the atmosphere, you will be modeling how even small amounts of these pollutants can add up in the air.

For each step, only add the "pollutants" if YOU did that activity in the last 24 HOURS!

1. Were a passenger in a vehicle
   - Pink, Blue, White, and Purple
2. Enjoyed air conditioning, heat or a hot shower
   - Orange, White, and Purple
3. Used nail polish or hairspray
   - Blue
4. Used a computer, IPOD or video game
   - Brown, Orange, and White
5. You or your family burned firewood or yard waste
   - Pink and Brown
6. You used paint
   - Blue and Yellow
7. Travelled down a dirt or gravel road
   - Brown
8. Mowed, used a leaf blower or weed whacker
   - Blue, Yellow, White, and Brown

9. Filled up on gasoline
    - Yellow and Blue
10. Were around someone who smoked
    - Pink, White, and Brown
11. Used a printer or copier
    - Blue

Conclusions:

Count your beads. The person with the least beads has the least air pollutant fingerprint. You breathe an invisible version every day!

Air pollution affects all living things. It causes health problems in humans and animals, damages plants, kills fish, pollutes water, eats away at infrastructure, and reduces visibility. It can also lead to acid rain, global warming, and smog. In the United States, for example, six out of every 10 people live in areas that fail to meet one or more federal air quality standards during some part of the year. Luckily there are agencies, like the United States Environmental Protection Agency (USEPA), that are looking out for the lungs, leaves, and gills of those who require some clean air!

Follow-up Questions:

- Compare your bracelet with other people in your class. Who was the “cleanest” and who was the “dirtiest?”
- What are some things that caused them to be different?
- What are other sources of air pollution that we did not include?
- How might your bracelets look if other pollutants were included?
- What activity added the most pollution to your bracelets? How often do you do that in a year?
- What are some ways to reduce your personal air pollution?
- Do you think the quality of the air in your state is good or bad? Why?