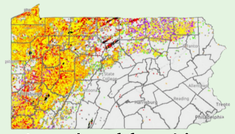
The Blooming
BENZENE DETECTOR

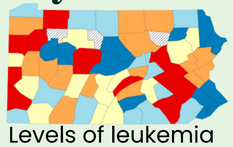
HOW TO USE

- Remove a small patch of grass around detector.
- Make sure the soil is not clumped together.
- Put the benzene detector in the ground about 8-12 inches deep.
- Make sure detector is given direct access to sunlight.
- Wait 24 to 48 hours for the detector to detect the benzene.
- Take out the disk.
- Send badge to the assigned analytical laboratory for analysis.

Benzene's Impact In Pennsylvania



Levels of fracking across Pennsylvania



Levels of leukemia across Pennsylvania

HOW PENNSYLVANIANS GET EXPOSED TO BENZENE:

- Fracking emits benzene into the soil.
- Contaminated soil then contaminates crops.
- Benzene can evaporate from the contaminated soil.

CAUSES HEALTH ISSUES SUCH AS:

- Leukemia
- Respiratory Issues
- Immune System Disorders
- Blood Disorders
- Bone Marrow Damage

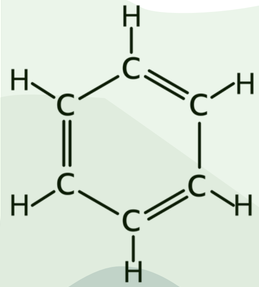
BENEFITS OF BENZENE DETECTION

- Knowing where benzene is located could help reduce the number of Leukemia cases.
- Environmental impacts such as degrading commercial water quality and harm to wild life, can be reduced.
- Detection can preserve the cleanliness of the local water environment and aid in the preservation of aquatic life.
- Detection of benzene in the environment can bring awareness to fracking dangers nationwide.
- STEM + Art = STEAM

CREDITS

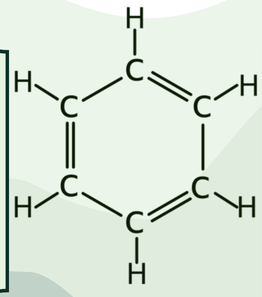
Hannah Misejka- Digital poster
Zane Callen- Prototype
Emma Murrell- Written report
Lainey Gracyk- Video, Budget
Agastya Narang- Outreach, Research

Penn Future, Range Resources (Canonsburg, PA), Ross Welding Supplies (Tarentum,PA), American Chemical Society, Staff Instructor Nelson Miller (ACFA)



ASK?

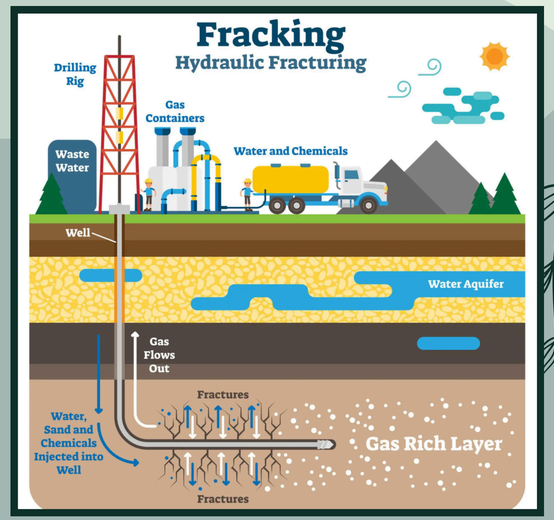
What is in Pennsylvania soil that negatively affects humans and the environment?



BUDGET

Total of $93.36

- Recycled Aluminum and copper sheets (free of cost)
- Glass tube stem ($2.75)
- Computer fan 50mmx50mmx10mm ($9.01)
- 9V battery connector ($7.41)
- Benzene Detector Badge ($74.19)



Engineering Process

- The original idea was to create a solar powered soil monitor
- With this idea, the thought process turned to how can solar detector be relevant to the lives of Pennsylvanians.
- Due to a few students having gas wells in their yards, the idea of benzene detection was chosen.
- Several failed attempts had to be reassessed; a design with a copper wire and UV light to help detect benzene gas was proven to be ineffective.
- "The Blooming Benzene Detector" was brainstormed, and a prototype was created.
- The machine needed to be accessible to all socioeconomic classes, and easy to manage so every Pennsylvanian can have equal access to better soil.

SCAN LINK