Ventilation & air filtration project ideas

Starter · A few weeks · Low-cost kit · Project idea

Online version: https://ai-safety-sandbox.vercel.app/projects/ventilation-and-filtration-ideas/

Summary

The source author’s top priority. Ideas range from DIY measurement to retrofit kits and modelling tools, and most need no lab.

Why it matters

Cleaner indoor air protects against many pathogens at once, including ones we have not met yet.

What you will have at the end

Depends on the idea you pick: a dataset, guide, tool or prototype.

Ideas to choose from

- Do cheap CO2 monitors match expensive ones?
- Measure ventilation rates yourself and write the DIY guide
- A clean dataset or review of indoor air-quality products
- A quick window seal with a fan port
- An easy retrofit kit for typical UK houses
- Photo of a room -> estimated air changes per hour
- A calculator for how powerful a fan or filter a room needs
- Why is the commercial air-filter market so poor? A logistics deep-dive
- Measured vs calculated ventilation: how far apart are they?
- Natural ventilation strategies across climate zones
- Survey of councils’ indoor air-quality programmes
- Cheap DIY PAPRs and filters

How to start (tick each box as you go)

- [ ] **1. Read the list of ideas above and pick the one you would most enjoy.**
- [ ] **2. Check the source to see whether someone has already done it.**
- [ ] **3. Scope it down to something you can finish in your available time.**
- [ ] **4. Do a quick first version and show it to someone.**
- [ ] **5. Write up what you made and share it with the source authors.**

Key terms

Air changes per hour (ACH)
How many times per hour a room's air is replaced with fresh or cleaned air. Higher ACH means airborne germs build up less.

Source and links

Hatta & Bazarragchaa — A hundred project ideas in biosecurity (2025)
https://casualphysicsenjoyer.com/Essays+in+progress/Biosecurity/A+hundred+project+ideas+in+Biosecurity

When you have finished

Write a few paragraphs on what you did, what you found and what you would try next, and share it with a friend, your society or online.

Courses, mentors, small grants and communities:
https://ai-safety-sandbox.vercel.app/next-steps/

Questions? Ask in AI Safety Cardiff University (AISCU): https://aiscu.org/

Notes