

UCR

Global Climate Change Workshop Series

High School Science Fair Projects

University of California Riverside
Dept. of Chemical & Environmental
Engineering

UCR | College of Engineering- Center for
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Atmospheric Chemistry

Research – Aerosol-Cloud Climate Interactions

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Idea 1

- › Simulate atmospheric conditions on another planet in a small reaction chamber.
 - › Student will select a planet and research known conditions
 - › Student would design biosphere/reaction chamber to mimic these conditions
 - › Test the ability of particulates to form under these conditions
 - › Derive conclusions and implications

Idea 2: The composition of Household Particles

- › Students will make makeshift filter samplers by attaching filters to the hose of a vacuum
- › Students will test their sampling design, in a zero-particle air facility (CE-CERT)
- › Students will collect particles from different rooms in their house (laundry room, TV room, bedroom, bathroom, garage, kitchen) or ambient
- › Send filters for chemical and physical analysis
- › This project may be split into several ideas that pertain to just one room (e.g., what is the air like in your backyard? what type of particles are you exposed to from cooking?)

Idea 3: The absorbance of particles on clothes

- › Students will design an experiment to test the affinity of different materials (wool, corduroy, cotton, fleece) to retain particles.
- › Once materials have been exposed to particles different types, sulfates, dust, BBQ smoke, wood smoke, etc.) students will record how the concentrations vary by distance and time from the material.
- › Has implications for the types of clothes you choose to wear in “smoky” locations and how they may affect your health once you leave.
- › Modeling the diffusion of particles may also be an option for advanced candidates.

Idea 4: Particles from Candles

- › When candles burn they emit gasses. These gases may react with oxidants in the air to form particles.
- › Students will select outdoor and indoor candles and expose them to common outdoor (O_3 and NO_x) and indoor (NH_3 , Cl) oxidants
- › Particle Number will be measured