

## Cleaning the Air Activity – Air Pollution Background Information



The impacts of technological systems can be good or bad, desirable or undesirable. Many times it is difficult to predict the outcomes of these systems. For example, could Henry Ford have predicted that ninety years later the technology he helped to create (cars) would be associated with thousands of alcohol related deaths and the cause of global air pollution? Recognizing the undesirable impacts of technology is often hidden by the glare of a technology's benefits.

When the outputs of technological systems are negative, we often rely on new technologies to control the problems created by old technologies. Environmental pollution is a good example of this cycle. Pollutants that have plagued our air, water and ground have found their way into our homes and places of work, creating indoor air pollution — known as “Sick Building” Syndrome. Particles such as dust, soot, asbestos and chemicals — many of which are invisible to the eye — are trapped in these environments and enter the body through the nasal and throat passages. Coughing, itchy eyes, sneezing, allergies, asthma and respiratory ailments (that may even result in death) are the effects of these pollutants.

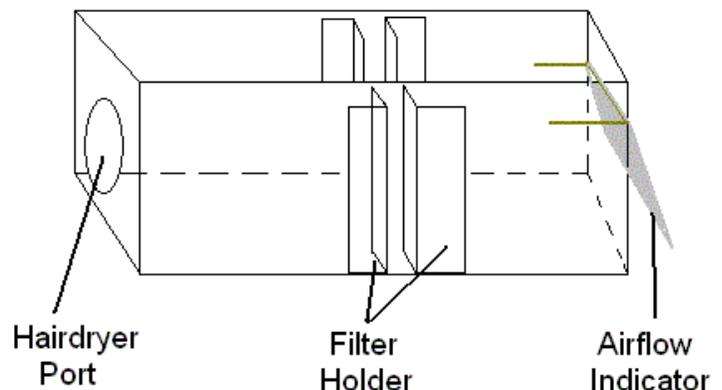
Mechanical and environmental engineers develop new technologies to control the problems that old technologies have created. For example, engineers have created air filtration systems that are now common appliances found in homes and businesses. Filtration systems are designed to scrub the air clean of harmful particles and chemicals. Using a variety of filtering techniques, these machines circulate the air several times each hour capturing harmful particles and making the air safe to breathe. In this activity, we are going to investigate the development of an indoor air filter.

### The Challenge

**Design, build and test** an air filtration system that can remove pepper particles from the air.

### The Criteria

1. You may only use materials that are provided by the teacher.
2. Your filter cannot block more than 50% of the air.
3. Your filter must be designed to fit into the testing apparatus filter slots.
4. You must test the filter at least once.



### What to Do

- Design a filter to remove pepper from the moving air. You may add at most two filter elements to the filtering device.
- Build the filter you designed with materials provided.
- Make and fill in the Cleaning the Air Worksheet when you test your filter.