Texas Connection

Activity #72
The Air We Breathe

Extra Resources

NASA Spinoff
Plants Clean Air and Water for Indoor Environments
http://spinoff.nasa.gov/Spinoff2007/ps_3.html

Wolverton Environmental Services, Inc.
Indoor Air Pollution
www.wolvertonenvironmental.com/air.htm

Texas Overview

"Houston, we have a problem." That one line from the hit movie Apollo 13 made the city of Houston, Texas, a household name. This line was in reference to the build up of carbon dioxide in the Apollo 13 space capsule. Luckily, NASA scientists created a filtration system that the astronauts could build on the spacecraft, allowing them to return home safely.

But that wouldn't be the only air problem folks in Houston would ever work on. Houston has had many air problems. It is one of the top cities in the nation when it comes to ozone alert days. The problem isn't limited just to outdoor air. The Houston area has been hit by several tropical storms and hurricanes that resulted in massive flooding and extensive home damage. The rebuilding and repair of these homes brought about a new set of problems related to indoor air pollution.

The indoor air quality problem became very noticeable in the 1970s during the first oil crisis. Buildings were built to be more energy efficient, which means they often didn't have opening windows. As a result, there was a buildup of volatile organic compounds (VOCs). These chemicals come off building materials, as well as carpets and upholstery. But there is a solution.

Former NASA Scientist Bill Wolverton discovered plants could help clean an indoor environment. NASA, together with the Associated Landscape Contractors of America (ALCA), researched many common houseplants to determine their effectiveness in removing pollutants from indoor air. Dr. Wolverton recommends two to three plants per every 10 square meters or 100 square feet of indoor space.

The following two pages will give you information on household items, the chemicals they emit and the plants best suited for cleaning them up.

Source	Formaldehyde	Xylene/ Toluene	Benzene	Trichloroethylene	Others
Adhesives	X	X	X		X
Caulking compounds	X	X	X		X
Ceiling tiles	X	X	X		X
Floor coverings	X	X	X		X
Paints	X	X	X		X
Particleboard	X	X	X		X
Permanent press clothing and upholstery	X				
Wall coverings		X	X		X
Printers, duplicating machines and copiers		X	X	X	X
Stains and varnishes	X	X	X		X

Plant	Scientific Name	Transpiration Rate	All Chemicals	Formaldehyde	Trichloroethylene	Benzene	Xylene
Areca Palm	Chrysalidocarpus lutescens	Extremely high	X				
Lady Palm	Rhapis excelsa	Very high	X				
Bamboo Palm	Chamaedorea seifrizii	Extremely high		X	X	X	
Rubber Plant	Ficus robusta (best of the Ficus species to use	High	X	X			
Janet Craig Dracena	Dracaena dermensis (best of the Dracaenas)	High	X		X		
English Ivy	Hedera helix	High	X	X			
Dwarf Date Palm	Phoenix roebelenii	High	X				X
Boston Fern	Nephrolepis exaltata "Bostoniensis"	Extremely high (best of all plants)	X (best of all plants)	X			
Peace Lilly	Spathiphyllum sp.	Very high	X	X	X	X	
Corn Plant	Dracaena fragrans "Massangeana"	High	X	X			
Florist Mum	Chrysanthemum morifolium	Very high	X	X			
Kimberley Queen	Nephrolepis obliterata	Extremely high	X	X			