



TeachEngineering

STEM Curriculum for K-12

INTRODUCTION TO ENVIRONMENTAL ENGINEERING



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What is Environmental Engineering?

Definition: The application of science and engineering knowledge and concepts to care for and/or restore our natural environment and/or solve environmental problems.

Who does it affect?

Everyone & Everything!

- Plants
- Insects
- Animals
- Humans
- Ecosystems
- Our planet



What are environmental issues?

Three areas:



Air quality

Land quality

Water quality

Air Quality

Why is air quality such a problem?

Poor air quality can lead to:

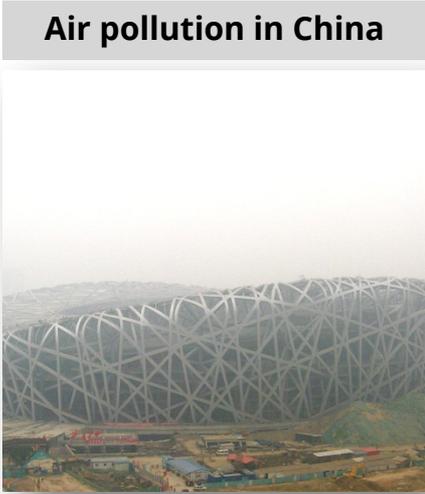
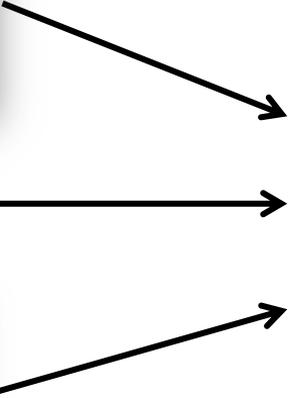
smog

acid rain

**respiratory & other
illnesses**

global warming

From where do air pollutants come?



Air Quality

Air pollutant: A known substance in the air that can cause harm to humans and the environment.

- nitrogen oxides (NO_x)
- sulfur oxides (SO_x)
- carbon monoxide (CO)
- carbon dioxide (CO_2)



effects of acid rain on plants



Greenhouse Gases & Global Warming

Global warming: An increase in the average air temperature of the Earth.

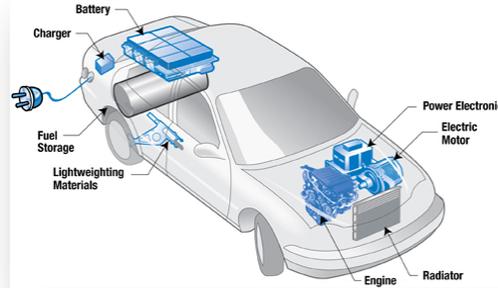
Greenhouse effect: Heat from the sun gets trapped inside the glass of a greenhouse and heats up its air.

More carbon dioxide (CO₂) being released in the atmosphere traps more heat.



How do we reduce air pollutants?

- carpool
- hybrid cars
- EPA government regulation
- NEW: geologic carbon sequestration
- alternative fuels
- walk, bike or use public transportation



Land Quality

- **Land pollution:** Destruction of the Earth's surface caused by human activities and the misuse of natural resources.
- **Natural resources:** Land and raw materials that exist naturally in the environment undisturbed by humans.
- **Renewable resource:** A natural resource that can be replaced by a natural process.
- **Non-renewable resource:** A natural resource that cannot be produced or re-grown or reused.

Examples

Renewable Resources

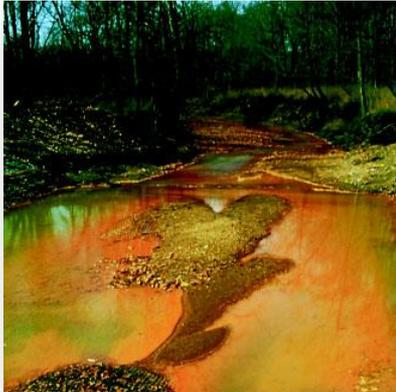


Non- Renewable Resources



What problems arise from land pollutants?

acid mine drainage



pesticides and herbicides



landfills



How do we reduce land pollution?

