

Auxiliary Concept: Environmental Considerations

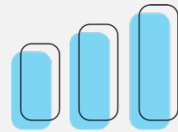
Engineering Literacy Dimension: Engineering Knowledge

Domain: Engineering Technical Applications

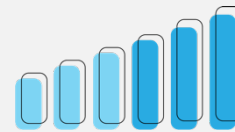
Overview: *Environmental Considerations* focuses on managing the use of natural resources to minimize the negative impacts that human activity can have on the environment. This includes work developing new and better ways to dispose of waste and to clean up pollution while understanding the impact government regulations and the methods for analyzing environmental change. This concept is important to Engineering Literacy, as extracting natural resources and transforming them into industrial/consumer products and structures can take a major toll on the environment. For example, building a hydroelectric dam to generate electricity can alter the ecosystem for aquatic life; extraction of natural gas from subterranean rock formations could potentially contaminate water sources; and burning of fossil fuels such as coal can contribute to increased levels of greenhouse gases in the atmosphere. As such, the knowledge relevant to Environmental Considerations, such as sampling and analysis techniques for surface water, groundwater, soil, and air, can aid in designing strategies to prevent/mitigate/remediate problems in an effort measurably enhance environmental quality.

Performance Goal for High School Learners

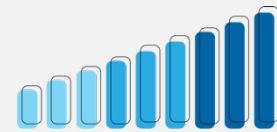
I can, when appropriate, draw upon the knowledge of Environmental Considerations content and practices, such as (a) *ground and surface water quality*, (b) *wastewater management*, (c) *air quality*, and (d) *environmental impact regulations and tests*, in order to design methods to protect and manage our air, water, soil, and related ecosystems.



Basic



Proficient



Advanced

GROUND & SURFACE WATER QUALITY

I can describe different types of contaminants and their sources influencing on ground and surface water quality.

I can explain the methods to measure and control water pollution.

I can analyze potential contaminants and their sources and then plan to measure and control water quality to solve a design problem calling for a wastewater treatment system.

WASTEWATER MANAGEMENT

I can describe different sources of wastewater (e.g. household activities, industrial wastewater, urban runoff, agricultural pollution, etc.).

I can explain different methods of wastewater management (e.g. disposing, reusing, and recycling liquid waste).

I can explain wastewater treatment processes (e.g. phase separation, oxidation, polishing, etc.).

AIR QUALITY

I can describe different types of contaminants and their sources influencing the air quality.

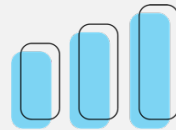
I can explain the methods to define, measure and control air pollution.

I can analyze potential contaminants and their sources, using instrumentation to inform solutions, designing systems to resolve air quality challenges.

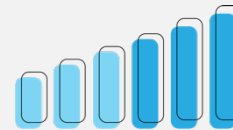
Auxiliary Concept: Environmental Considerations Cont.

Performance Goal for High School Learners

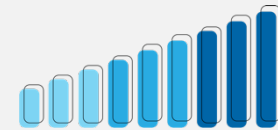
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Basic



Proficient



Advanced

ENVIRONMENTAL IMPACT REGULATIONS & TESTS

I can describe the purpose of environmental impact regulations and tests.

I can explain the national environmental policies and assessment procedures, searching for the documents developed by the federal agencies establishing policies and assessing environmental impacts.

I can evaluate a given design solution in consideration of the national environmental policies and assessment procedures.